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CONTENTS

Farm Price Policy and the Farm Vote ..... *Charles M. Hardin* 601

Consumer Knowledge of Quality Determining Factors in Eggs ..... *A. L. Owens and F. R. Taylor* 625

The Measurement of Consumer Preferences .. *V. James Rhodes* 638

Impact of Price Expectations and Uncertainties on Decision Making by Poultry Firms ... *T. C. Morrison and G. G. Judge* 652

Problems of Factor-Product Aggregation in Cobb-Douglas Value Productivity Analysis ..... *James S. Plaxico* 664

Benefit-Cost Analysis and Public Resource Development .... *S. V. Ciriacy-Wantrup* 676

Consumer Demand for Cigarettes Estimated from State Data ..... *Frank H. Maier* 690

Rural Merchandising in the Alabama Black Belt . *Glenn N. Sisk* 705

A Modified Compensatory Price Program for Agriculture .... *G. E. Brandow* 716

Benefits Versus Costs of Price Supports .... *Anthony Y. C. Koo* 731

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THE AMERICAN FARM ECONOMIC ASSOCIATION
Volume XXXVII NOVEMBER, 1955 Number 4

CONTENTS (Continued)

NOTES

A Row Sum Check Upon Computational Accuracy in Mathematical Programming Problems ..... *R. F. Hutton* 734

Variability of Returns from the Hog Enterprise ..... *Earl R. Swanson* 736

Factors and Fundamentals ..... *C. V. Plath* 739

PUBLICATIONS RECEIVED 740

BOOK REVIEWS:

J. Frederic Dewhurst and Associates, *America's Needs and Resources: A New Survey* ..... *Karl Brandt* 746

Geoffrey S. Shepherd, *Marketing Farm Products* ..... *Robert W. Rudd* 749

H. M. H. A. van der Valk, *The Economic Future of Canada* . *Ben A. Lindberg* 751

Elmer J. Working, *Demand for Meat* ..... *William G. O'Regan* 752

Richard L. Kohls, *Marketing of Agricultural Products* ..... *Edward H. Ward* 755

Charles M. Hardin, *Freedom in Agricultural Education* ... *Lawrence W. Witt* 757

Lauri O. af Heurlin, *The Economic Theory of Agricultural Production* ..... *Sidney Hoos* 759

Alexander Arkhimovich, *Sugar Beets in the USSR: Selection and Seedbreeding* ..... *V. P. Timoshenko* 760

Leland Spencer and S. Kent Christensen, *Milk Control Programs of the Northeastern States, Part I Fixing of Prices Paid and Charged by Dealers* ..... *Hugh L. Cook* 762

Gove Hambidge, *The Story of FAO* ..... *Alexander Eckstein* 764

Ronald L. Mighell, *American Agriculture: Its Structure and Place in the Economy* ..... *H. Brooks James* 767

Raymond R. Beneke, *Managing the Farm Business* ..... *Emery N. Castle* 768

Arthur Smithies, *The Budgetary Process in the United States* ..... *Donald C. Horton* 770

OBITUARY—Benjamin Horace Hibbard 772

NEWS NOTES 773

INTERNATIONAL CONFERENCE OF AGRICULTURAL ECONOMISTS 785

AWARDS PROGRAM FOR 1956 788

AFEA WINTER MEETING IN NEW YORK 790

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JOURNAL
OF
FARM ECONOMICS

Volume XXXVII NOVEMBER, 1955 Number 4

FARM PRICE POLICY AND THE FARM VOTE*

CHARLES M. HARDIN
University of Chicago

WHAT is happening in the United States to the political process for formulating farm price policy? Despite the wide belief that this process is non-partisan certain congressional votes show a striking tendency for legislators to divide along party lines on key farm political issues. Democrats tend to become identified with high, fixed price supports; Republicans, with flexible price supports. As recently as 1948 the various group interests in agriculture and both political parties appeared to be concerting a policy to replace wartime guarantees of 90 per cent of parity for numerous farm products with a program of flexible price supports especially for certain basic commodities,[1] supports that would fluctuate with the size of the carryover of the commodity in question—the higher the carryover, the lower the support price, and vice versa.

President Truman's 1948 campaign began to put the Democratic Party on record in favor of supports at 90 per cent of parity for farm product ., and this position was reinforced by Secretary Brannan's Plan in 1949 and the Democratic Platform in 1952. This Democratic departure seemed to assume that a shift in the Midwestern farm vote in response to the Truman-Brannan attacks upon the Republican 80th Congress had caused the Democratic victory. An examination of the 1948 election throws doubt upon this interpretation, and a study of subsequent elections suggests that rural Midwestern congressmen have probably had more leeway for political maneuver on farm price policy than they and many publicists thought.

This much is offered in the belief that a more accurate description of

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* An earlier draft of this paper was summarized in May, 1955, at the Midwest Conference of Political Scientists. Subsequently, the writer profited from the comments of a number of persons to whom the draft was submitted.

[1] Cotton, corn, wheat, rice, and peanuts. Tobacco was to be guaranteed 90 per cent of parity so long as its growers accepted marketing quotas.

the process of policy making will aid politicians in practicing "the art of the possible." It may suggest to them what range of alternatives is feasible politically; and it may help their strategy, tactics, and timing. But the description itself provides no criteria for choosing among alternative price policies. Here the writer relies on the proposition that prices should be tools of policy rather than ends in themselves.[2] Accordingly, price supports should be flexible rather than high and fixed.

No conclusive appraisal of the farm-price policy-making process is permissable on the evidence brought forth here. Organized farm groups, agricultural administrative agencies, and farm congressmen lustily participate in making policy. But partisan politics now seems to play a stronger role, and some efforts are noticeable to reconstruct the farm-labor coalition of the late 1930's. Sometimes the process has worked in the public interest;[3] sometimes it has worked against it—and this has been true whether the element of partisanship has been strong or weak. So far as farm price policy is concerned,[4] given the considerable assumptions about ends and means inherent in the American value system, the criteria of what is in the public interest are discoverable essentially by economic analysis; but the delineation of what is feasible is a political problem.

1. *Is Congressional Farm Politics Becoming More Partisan?*

Since the nation began to talk about the "farm bloc" in the 1920's, farm politics has seemed to rest upon a bipartisan base.[5] Both logic and

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[2] Cf. T. W. Schultz, *The Production and Welfare of Agriculture* (New York: The Macmillan Co., 1949), Ch. 15; D. Gale Johnson, *Forward Prices* (Chicago: Univ. of Chicago Press, 1947), Ch. III; John D. Black and Maxine Kiefer, *Future Food and Agricultural Policy* (New York: McGraw-Hill Book Co., Inc., 1948), Ch. XXI.

[3] The writer can say little more about the fascinating and controversial question of the public interest in this paper. The strongly-held position that there is nothing that social scientists *as scientists* can hope to discover to be in the public interest seems to root in A. F. Bentley's *The Process of Government* (Chicago: Univ. of Chicago Press, 1908; Bloomington, Ind., The Principia Press, 1949), pp. 226-27, 370, and 422. On the other hand, see C. J. Friedrich, *Constitutional Government and Democracy* (Boston: Ginn and Co., 1950), pp. 262, 264-5, 462; and Walter Lippmann, *The Public Philosophy* (Boston: Little, Brown, and Co., 1955), passim., but particularly ch. IX.

[4] It should be stressed that on many other matters, e.g., security policy, foreign policy, and policy respecting the relationship of the state to private groups, economic analysis plays a much smaller role in showing what is in the public interest.

[5] Some informed persons strongly dissent from this view. One commentator on this paper writes: "What makes you think that partisanship is more of a factor in agricultural policy determination now than it was in earlier years? Throughout the Twenties, Thirties, Forties and Fifties there have been important differences between the Democrats and Republicans on agricultural policy and farmers have been aware of them. Even in the Twenties, the Republicans were considered less friendly to government action in behalf of agriculture—in spite of the fact that the 'farm bloc'

some historical evidence support this conclusion; yet recent experience may require a considerable re-appraisal. Are recent departures merely sharp manifestations of the perennial strains experienced by any cross-party bloc? Or are they signs of much more fundamental weaknesses in the coalition and perhaps of striking innovations in the process?

Logical reasons for bi-partisanship in agriculture are found in the nature of the "farm problem" and of farm policy designed to meet it, in the distribution of farmers and of their voting habits, and in the size and distribution of membership in farm organizations. A long period of farm prosperity after 1896, culminating in an exhilirating rise in World War I, nourished farmers' hopes and raised their sights. Then the devastating price break in 1920 ushered in a decade of frustration for much of agriculture. While other groups rapidly improved their material well-being, farmers saw their prices fall, their costs stay fixed, and their mortgages come due as inexorably as death and taxes. Small wonder that farm unrest erupted in 1920 and remained active. When the great depression arrived some major political response to farm demands became imperative. Farm leaders concluded that only the federal government had the resources to help dig the farmer out of the mud. Moreover, the major areas of farm production—wheat, cotton, corn-hog, dairy, livestock, and tobacco—all sprawled across state borders. If political remedies were to be had, clearly they would have to be regional and national; hence they would have to be underwritten and enforced by the federal government.

In order to get federal action, the coalescing farm political demand had to cross party lines. In 1950, of 25 million persons living on farms (according to the census) nearly 13 million were in 16 Southern states where predispositions were presumedly heavily Democratic. Some 8 million of these farm-dwellers lived in twelve North Central states and tended, many of them, toward Republicanism. If the Midwest was heavily Democratic during the early New Deal, by the election of 1938 its Republicanism (in rural areas and small towns) had reasserted itself. Although the first versions of major farm bills, the Agricultural Adjustment Act and related measures, could be formulated and carried through congresses that were primarily Democratic, after the 1938 election this legislation had to be serviced and re-negotiated by congresses that were much

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was heavily Republican." Other commentators explicitly or implicitly accepted the proposition in the text. Two things seem to be involved. First, differences have existed between the parties—differences in attitude, temper, and approach to public issues (Pendleton Herring, *The Politics of Democracy* (New York: Rinehart and Co., 1940, p. 111). But, second, political parties have ordinarily not *as parties* actively participated in making farm price policy—unless a tendency toward this participation has occurred in very recent years.

more evenly divided. Meanwhile, a major farm organization had emerged, the American Farm Bureau Federation (AFBF), which was a "union of cotton and corn"[6] that did much to provide the power base for agricultural price legislation. Created in 1919, the AFBF grew rapidly in membership, then declined to only 160,000 members in 1933, then rapidly and steadily expanded to its current strength of some 1,600,000. In recent years about half the AFBF members have been in the Middle West, about 30 per cent in the South.

These are logical reasons for the existence of a farm bloc in Congress; are they reflected in reality? Congressman Walter Judd (R., Minn.) declared in the debate on the Benson farm bill in 1954 that the farmer was in trouble but not through his own fault nor through "the fault of Mr. Benson or Mr. Eisenhower, or Mr. Truman or Mr. Roosevelt. The farm program, under which the farmers are having so much difficulty, was written by the farm bloc in the Congress. It did not pay any attention to Mr. Roosevelt, [nor] to Mr. Truman, [nor] Mr. Brannan. It does not intend to pay any attention to what Mr. Eisenhower or Mr. Benson recommend. It [has] always [written] its own bills and [has] had enough votes to put them through. . . ."[7]

Some evidence supports this widely-held interpretation of the existence, persistence, and power of the farm bloc. When the agricultural bloc was formed in 1921, it reached a peak strength of 55 Senators–28 Republicans and 27 Democrats. In 1927, bi-partisan majorities passed the McNary-Haugen Bill, which President Coolidge vetoed.[8] In 1942, the "farm bloc" amendment to the second price control bill was passed by a bi-partisan coalition over administration protests, although the administration was able to reverse the decision later.[9]

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[6] J. K. Galbraith, "The Farm Bureau," *Fortune*, June, 1944. One correspondent believes that the text credits the Farm Bureau with too much influence in bringing about the "real union of cotton and corn in the political, legislative sense," a union that came several years after the formation of the American Farm Bureau Federation "when the tobacco co-ops and leaders swung into line."

[7] 100 *Congressional Record*, p. 8991, 83d. Cong., 2nd Sess, Daily Ed.

[8] The Senate passed the bill 47 to 39 (22 Democrates, 24 Republicans, and one Farmer-Laborite in the majority; 17 Democrats and 22 Republicans in the minority). The House passed it 214 to 178 (112 Republicans, 97 Democrats, and five members of minor parties made up the majority; 108 Republicans and 70 Democrats were the minority). *Congressional Quarterly Almanac* Vol. V, 1949, p. 108.

[9] In the Senate vote of 48 to 43, 31 Democrats and 15 Republicans favored the amendment, 30 Democrats and 13 Republicans opposed it. In the House 105 Democrats joined 99 Republicans to approve the amendment; 118 Democrats and 53 Republicans opposed. *Congressional Quarterly Almanac* Vol. V, pp. 110, 112; but for the eventual administration victory, see James B. Eckert, ed., *Problems in Price Control: Pricing Standards*, General Publ. No. 7, Historical Reports on War Administration: Office of Temporary Controls: OPA, Washington, D.C. (1947), the account by Sol A. Segal, esp. pp. 160 ff.

Professor Julius Turner has found contrary evidence in his study of four congressional sessions (1921, 1930-31, 1937, and 1944); taking all roll-call votes, he developed an index that enabled him to compare the cohesiveness of partisanship with that of sectional, nationality, rural, and urban influences. He concluded that congressmen have voted much more cohesively as party members than as farm representatives, even on farm matters. Turner's study is not completely convincing as an explanation of the farm votes in Congress. First, his sessions do not include the significant farm bills of the last 30 years and, second, several of his farm measures are either trivial or are mistakenly classified.[10] On the other hand, Turner's evidence, here and elsewhere,[11] has jolted the general finding[12] that not only farm policy but other major policies are generally the product of bi-partisan agreement.

Other evidence is appearing that calls in question the traditional bi-partisan interpretation of farm politics in Congress. In 1954, crucial votes on farm legislation occurred in both Senate and House. The Eisenhower administration favored a flexible price support bill in which price supports on the "basic" farm commodities would range from 75 to 90 per cent of parity in inverse proportion to the size of the carry-over. Both Senate and House Committees on Agriculture, however, amended the

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[10] His sessions do not include the years of major legislative action on farm price support and production control measures that are the heart of farm policy: 1927 and 1928 (McNary-Haugen Bills), 1929 (Agricultural Marketing Act), 1933, 1935, 1938, 1941, 1942, 1948, 1949, 1950, 1952, and 1954 (the Agricultural Adjustment Act and its amendments).

In 1931, he cites an emergency farm relief bill, but the only measure in that session that appears relevant was a bill for relieving the unemployed by distributing food, and this was not a farm relief bill. In 1944, he cites OPA subsidies, but this was not a farm question; rather it was designed to keep down the cost of living. In 1937, he cites 12 roll-call votes. But 5 of these were votes on reclamation projects; they are not votes that involve the farm bloc, if there is one. Two votes on farm forestry were trivial and one on the administration of the farm tenancy program was really on an issue having to do with civil service rather than farm politics. See *Party and Constituency: Pressures on Congress* (Baltimore, Md.: The Johns Hopkins Press, 1951).

[11] Julius Turner, "Responsible Parties: A Dissent from the Floor," *American Political Science Review*, Vol. XLV, March, 1951 pp. 143 ff. See also votes on the A.A.A. of 1933 and The Soil Conservation and Domestic Allotment Act of 1936, *Congressional Quarterly Almanac*, Vol. V, 1949, 104-5.

[12] For agriculture, see, e.g., Wesley McCune, *The Farm Bloc* (New York: Doubleday Doran, 1943), p. 44; for a collection of citations, E. E. Schattschneider, *Party Government* (New York: Farrar and Rinehart, Inc., 1942), p. 131. See also the report of the committee of the American Political Science Association, "Toward a More Responsible Two-Party System," *American Political Science Review*, Vol. 44, Sept., 1950, Supplement. See also the works of Holcombe and Griffith cited later. It should be pointed out that much cooperation among leaders of different parties often goes into the formulation of measures on which, at some point, record votes are taken and show considerable partisan division. In this respect, reliance upon the "box score" in roll call votes may mislead.

bill to provide for a continuation of 90 per cent supports. On the House and Senate floors the administration succeeded in reversing the committee positions by securing a modified flexibility, ranging from 82.5 to 90 per cent of parity. The crucial votes were on the substitute of flexible supports for the flat 90 per cent contained in both committee bills. In the House flexible supports carried by a vote of 227 to 170; 182 Republicans and 45 Democrats voted "aye" while 147 Democrats and 23 Republicans voted "nay." In the Senate, flexible supports carried by a vote of 49 to 43. Voting "aye" were 39 Republicans and 10 Democrats; voting "nay" were 8 Republicans and 35 Democrats. Obviously these are partisan votes.

The 1954 experience encourages one to look at other votes in recent years, aided since 1945 by the invaluable analyses of the *Congressional Quarterly*. Early in World War II Congress raised farm price support props to 90 per cent of parity on the basic commodities, authorized a similar level of support on other crops or farm produce proclaimed by the Secretary of Agriculture to be essential for the war effort, and decreed the continuation of supports at such levels for two calendar years after hostilities had been officially declared to be ended. That crucial two-year period expired on January 1, 1949; consequently Congress either had to enact new farm legislation before adjournment in 1948 or let the Agricultural Adjustment Act of 1938 take effect—and the 1938 Act provided for flexible price supports at only 52 to 75 per cent of parity and only for the basic crops.

In the early morning hours before Congress adjourned in June, 1948, just in time for the Philadelphia Convention that nominated Governor Dewey for the Presidency, both houses accepted a conference committee report that had "reconciled" the radically different House and Senate farm bills by jamming them together—it was something like swallowing spinach *à la mode*. The Aiken (Senate) Bill provided for flexible price supports; the Hope (House) Bill for continuation of 90 per cent supports for one year. The Hope-Aiken Act accepted the Hope one-year extension but provided that flexible supports would then take gradual effect.

In 1949 the Democratic administration brought out the Brannan Plan which would have raised the level of farm supports, extended such supports to a considerably larger list of "basics," and provided that perishable commodities should be permitted to find their own price in the market while the farmer should receive the difference between that price and the price which, multiplied by the quantity that he produced, would give him the desired "income support level." Storable commodities were to continue to be supported by the traditional loans-without-recourse of the Commodity Credit Corporation. Congress rejected the Brannan Plan and passed the Anderson Bill which, in effect, did what the Hope-

Aiken Bill had done the year before—extended 90 per cent supports for one year but provided for flexible supports to take effect by gradual steps after 1950. Congress continued to postpone the day when flexible price supports would take effect. The last such extension was in 1952 and guaranteed the basic commodities 90 per cent supports through 1954. In 1954, Congress finally adopted a modified version of the flexible principle for 1955.

Now let us look at the votes. In 1948 no record House of Representatives vote was taken on the Hope-Aiken Bill. The Senate passed the Aiken Bill by 79 to 3 on June 17—an impressive demonstration of bi-partisanship. But this vote followed shortly after Senator Russell had proposed to substitute the Hope Bill, which had just been passed by the House, for the Aiken Bill. The Russell amendment lost 55 to 27; but 24 Democrats voted with Russell and only 16 against him while Republicans rejected his motion 39 to 3. *(Congressional Quarterly Almanac,* Vol. IV, 1948, pp. 53 ff.)

In 1949 the Agricultural Act (the Gore-Anderson Bill) passed each House with the customary bi-partisan majorities. In the House the vote was 383 to 25 with Democrats voting 233 to 11 for the Bill and Republicans, 150 to 14. On July 21, 1949, however, a crucial vote occurred when the Gore amendment was substituted for the Pace Bill. Congressman Pace (D., Ga.) had introduced a bill that would have provided a "trial run" of the Brannan Plan for three commodities. But the Gore substitute (which was substantially in line with the eventual legislation) was accepted by a vote of 239 to 169. Actually, the Democratic majority favored Pace's bill by 165 to 79; but the Republicans backed Gore 160 to 4. Much the same thing happened in the Senate which accepted the conference committee report on the Agricultural Act of 1949 by a vote of 46 to 7 on October 19 (27 Democrats voted "aye" as did 19 Republicans; 7 Republicans voted "nay"). On October 4, however, a significant vote occurred on the Anderson motion when the Senate agreed to recommit the farm bill with instructions within 48 hours to report a measure that would provide for flexible price supports at modernized parity. The Democrats opposed the Democratic Senator (and former Secretary of Agriculture) by a vote of 24 to 15; Republicans supported him 26 to 5. *(Congressional Quarterly Almanac,* Vol. V, 1949, pp. 100 ff. and 177 ff.)

In 1950 no record votes on farm price support occurred in the House of Representatives. In the upper chamber, efforts by Senator Williams (R., Del.) to put flexible price supports into effect immediately were defeated by bi-partisan majorities.[13] On the other hand, the Agricultural

[13] The Williams's amendments were offered to the bill to liberalize cotton and peanut planting allotments. The first amendment that would have introduced the sliding scale immediately was defeated 59 to 17 with Democrats voting 40 to 5

Adjustment Act was amended to liberalize cotton and peanut acreage allotments and to provide price supports for potatoes only if they were sold pursuant to marketing agreements under the Agricultural Marketing Agreement Act of 1937. These amendments squeaked through, with a majority of each party lined up on opposing sides.[14] The votes followed closely upon congressional acceptance of the federal margarine tax repealer (a measure that ended a federal tax that for approximately half a century had severely penalized interstate commerce in colored margarine). Republicans may still have been smarting from the defeat.[15]

In 1952 the only relevant vote of record was on June 30 when the House of Representatives passed the bill to extend 90 per cent supports on basic agricultural commodities 207 to 121. Democrats favored passage 133 to 35; Republicans opposed the bill 85 to 74.[16] The 1954 vote has already been described. On May 5, 1955, the House of Representatives voted 206 to 201 to restore 90 per cent supports on the basics. Democrats backed the measure 185 to 29; Republicans opposed it 172 to 21.[17]

These votes suggest a tendency, perhaps sharpened in recent years, for legislators to divide along party lines on crucial votes on farm price policy measures. The votes also bear out the identification of Democrats with price supports for basic commodities at 90 per cent of parity; of Republicans, with flexible price supports. But the evidence does not sustain a sweeping interpretation[18] that farm policy has suddenly become partisan. A number of final votes have been noted that were clearly bipartisan, as were the significant votes on the Williams' amendments in 1950. Ranking farm leaders (Congressman Hope among Republicans; Senator Anderson among Democrats) continue to oppose majorities of their partisan colleagues. Moreover, some apparent partisanship on

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against the measure and Republicans opposing it 19 to 12; the second amendment, providing for flexible supports to take effect the first of 1951, lost 55 to 20. Democrats voted against it 39 to 6; Republicans, 16 to 14. *Congressional Quarterly Almanac*, Vol. VI, pp. 72 ff., 98 ff.

[14] The House adopted the conference committee report 195 to 157; Democrats voted for the report 144 to 67; Republicans voted 90 to 51 against it. The Senate approved the report 37 to 33; Democrats voted for it 34 to 5; Republicans were opposed 28 to 3. *Ibid.*

[15] In the Senate a motion by Gillette (D., Iowa) to repeal the federal tax but to forbid the sale of colored margarine in interstate commerce lost 48 to 37. Democrats voted 37 to 10 against Gillette (and his 25 co-sponsors); Republicans supported him 27 to 11. The House of Representatives accepted the conference committee report on the bill 262 to 106; Democrats voted 196 to 26 for the report; Republicans opposed it 80 to 61. *Ibid.*

[16] *Congressional Quarterly Almanac*, Vol. VIII, p. 88.

[17] *Congressional Quarterly Log*, Week ending May 6, 1955, p. 516.

[18] See, e.g., Fred Bailey, "Washington Report," *National Grange Monthly*, July, 1955, p. 12.

penultimate votes may be explained by the desires of congressmen to be recorded on both sides of controversial issues—and thus to have evidence of their propriety for different groups of their constituents.[19]

A rather obvious explanation, if a very general one, of congressional voting behavior on recent farm issues is that it has been cross-pressured. On the one hand, farm congressmen have been motivated as have other agricultural leaders to cement the farming interest into a steadfast and effective power base for farm legislation. This has meant marshalling a number of sectional and commodity interests, but particularly cotton and corn. Thus the McNary-Haugen Bills could only be pushed through Congress in 1927 and 1928 after Midwestern and Southern farm leaders united in 1926.[20] Repeatedly thereafter, farm congressmen demonstrated their consciousness of and acceptance of the need for bringing major farm interests together in agricultural price legislation. The commodity sections of the Agricultural Adjustment Act of 1938 with separate policy declarations for cotton, corn, wheat, rice, and tobacco (peanuts being added later), show the interests that had to be fitted together into a general program.

Nor was the compulsion to build a concert of interests always a simple exercise in log-rolling. Grinding inter-sectional and inter-commodity conflicts abound in agriculture, and the art of holding the coalition together may require the painful arbitration of issues in which one interest submits to another. In 1938 the Boileau amendment sought to prevent acres taken out of cotton from being used to produce feed for livestock the produce of which would be sold in competition with livestock products (especially dairy products) produced in other sections.[21] In 1955 exactly the same problem had reappeared. Some 30,000,000 acres had been taken out of cotton and wheat production under marketing quotas, pursuant to federal legislation. If this acreage were put into feed crops, e.g., grain sorghums, barley, or oats, many felt that the effect would be self-defeating. Secretary Benson at first issued orders that would have rather effectively insulated the diverted acres from the market; but on the eve of the election in November, 1954, he reversed the order and permitted diverted acres to be planted to crops not themselves under restrictions. The American Farm Bureau Federation, staunch supporter of the Secre-

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[19] Reportedly, Congressman Sid Simpson (R., Ill.) voted in committee for flexible price supports in 1954 but reversed his position on the floor to favor 90 per cent of parity. Cf. Roland Young, *This Is Congress* (New York: Knopf, 1943), pp. 162-3; see also section 6 below for other modifications of the partisanship theory.

[20] Chester C. Davis, "The Development of Agricultural Policy Since the End of the World War," *Farmers in a Changing World, Yearbook*, USDA, 1940, pp. 297 ff. at pp. 304, 310.

[21] *Agricultural Adjustment 1937-38*, USDA, Agricultural Adjustment Administration, Washington: GPO, 1939, p. 308.

tary in his flexible price policy, bitterly complained at this relaxation.[22] By mid-1955 "an avalanche of new feed grains" was in prospect.[23]

Much political behavior in agriculture can thus be explained as an effort to maintain a bi-partisan, an inter-sectional, and a multi-commodity coalition in the face of persistent conflicts of interest. Yet all congressmen are strongly influenced to be partisan—the rewards to the successful political party in patronage, prestige, and power are very great. In recent years the line has often been drawn between Republican flexible price supports and Democratic guarantees of 90 per cent of parity. Many Democrats apparently thought in 1954 that they could make political capital by sticking to 90 per cent supports and tagging the Republicans as anxious to "flex the farmer." Many Republicans either believed in a certain amount of flexibility or were induced to support it. Presumedly congressmen in both parties were anticipating voters' reactions. How have farm voters behaved in recent years? How did they behave in 1954?

2. *How the 1948 Farm Vote Was Interpreted*

Interpretation of the farm vote in 1948 has apparently had profound effects upon farm price policy. At that time the Department of Agriculture, both political parties, and the major farm groups had virtually agreed to reintroduce a sliding scale of price supports (or flexible price supports). Senator Aiken (R., Vt.), Chairman of the Senate Committee on Agriculture and Forestry in the 80th Congress, incorporated these proposals in his bill; the Democratic Secretary of Agriculture, Clinton Anderson, endorsed them; the American Farm Bureau Federation (over bitter Southern objection, it is true) had espoused similar policies since 1947; and even the National Farmers Union was quite willing to accept both modernized parity and flexible price supports as late as April 18, 1948.[24] But the election of the following November changed things.

President Truman received 303 electoral votes in that election, needing 266 to win. Since he lost New York, Pennsylvania, New Jersey, Connecticut, Deleware, and Michigan, all of which Roosevelt had won in 1944, it was extremely important that he held Illinois and recovered Ohio, Iowa, and Wisconsin. Truman's victory in these four states with 75 electoral votes has been the basis of the assertion that he won the election in the farm belt. A. N. Holcombe had previously shown how American partisan strategy in the presidential sweepstakes had shifted

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[22] See the *Nation's Agriculture* for Jan., 1955, p. 15 and *Hearings*, Agric. Approp., fiscal 1956, H. of R., Part 4, 84th Cong., 1st Sess., pp. 2169-70; *Wallace's Farmer and Iowa Homestead*, Aug. 6, 1955, p. 6.

[23] *New York Times*, July 24, 1955, Sec. 3, p. 4.

[24] *Hearings*, Agricultural Act of 1948, S. 2318, 80th Cong., 2nd Sess.

from making winning sectional combinations to appealing successfully to strategically located middle classes, especially the urban middle class.[25] Nevertheless, Holcombe wrote that the "grain-growing and stock-raising interests still held the balance of power in 1948. . . ."[26] Louis Bean declared that "farmers played as vital a part in the Truman victory as the Populist 'green uprising' did in the political victories of sixty years ago."[27] Samuel Lubell wrote of the "swing to Truman in the farm states" and, by inference, placed considerable stress on the shift in the farm vote in explaining Truman's victory.[28] Many journalists expressed similar views.[29] Among political scientists, however, Samuel J. Eldersveld took notable exception to this interpretation.[30]

Congressmen apparently believed that Midwestern farmers provided the shifting vote that elected Truman. As the 1952 election approached, fourteen prominent Republican congressmen jointly called for a "strong" farm plank and carefully avoided mentioning flexible price supports.[31] On June 30, 1952, the House of Representatives voted to extend 90 per cent of parity supports on the basic crops through 1954. Seventy-four Republican congressmen favored the extension. Of these, 54 came from Ohio, Indiana, Illinois, Iowa, Kansas, Nebraska, South Dakota, Minnesota, and Wisconsin. In 1954 the issue arose again. Congressman Cooley (D., N. Carolina) predicted a rout of the proposal for flexible price supports in Congress, saying that it would be lucky to get five of the thirty votes of members on the House Agriculture Committee.[32] Although the administration vigorously sponsored price supports flexible at 75 to 90 per cent of parity, both the House Committee on Agriculture and the Senate Committee on Agriculture and Forestry in this Republican Congress reported bills extending 90 per cent supports.

Mustering extraordinary strength on the floor, the administration managed to reverse committee action in both houses. But the end was attained only by raising the sliding scale from 75-90 per cent to 82½-90 per

[25] *The Middle Classes in American Politics* (Cambridge, Mass.: Harvard University Press, 1940), pp. 219, *passim.*

[26] *Our More Perfect Union* (Cambridge, Mass.: Harvard University Press, 1950), p. 117.

[27] *The Mid-term Battle,* p. 7.

[28] *The Future of American Politics* (New York: Harper and Brothers, 1952), Ch. VIII; cf. his article in the *Chicago Daily News,* Oct. 6, 1954, "Price of Hogs May Determine Who Runs Senate: Expected Drop this Month Could Lose Corn Belt for GOP."

[29] Marquis Childs, *Washington Post,* Feb. 23, 1952, William M. Blair, *New York Times,* March 16, 1952; Luther A. Huston, *New York Times,* Nov. 6, 1952; Arthur Krock, *New York Times,* Feb. 15, 1953.

[30] "The Influence of Metropolitan Party Pluralities in Presidential Elections Since 1920," *American Political Science Review,* XLIII, Dec., 1949, pp. 1189 ff. at p. 1200.

[31] *Washington Post,* May 28, 1952.

[32] *New York Times,* Sunday, May 9, 1954.

cent of parity, apparently by offering a sop to the sheepmen in the form of a kind of "Brannan plan" for wool, and by establishing a set-aside program that had the effect of providing that only on wheat (in which enormous surpluses had accumulated) would price supports fall to 82.5 per cent of parity.[33]

Even so, the amendment to substitute flexible for fixed price supports carried on the floor of the House only by 179 to 164 on a teller vote.[34] Congressman Poage (D., Texas) praised the nineteen Republicans who voted in favor of fixed price supports—who had "let principle weigh heavier than any political whip that could be applied to their backs." Of Congressman Hope, he declared: "We all know the kind of pressure that has been exerted in the last twenty-four hours."[35] As already noted, the record House vote was 228 to 170 for flexible price supports. Only 23 Republicans voted against the measure; 18 of them came from Illinois, Iowa, Kansas, the Dakotas, and Minnesota.[36]

To evaluate such votes one must recall (a) that the official Republican position strongly favored flexible price supports in 1954 and (b) that the powerful Farm Bureau, by all odds the strongest farm organization in Midwestern states, vigorously fought for flexible supports. To break with both their party and the strongest interest group involved, these Midwestern congressmen must have thought that their farmer constituents strongly favored 90 per cent price supports and would vote accordingly, come November. If so, this congressional belief must have rested essentially on the interpretation that the farmers elected Truman in 1948.[37]

3. *A Re-examination of the 1948 Farm Vote*[38]

In 1948 Midwestern farmers contributed to President Truman's victory, but their contribution has been greatly exaggerated. Consider the

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[33] The act provides $2,500,000,000 to set aside three to four million bales of cotton, four to five hundred million bushels of wheat, and so forth. These amounts would not be used in calculating total supply so far as figuring the support level is concerned; consequently, supports are higher than they otherwise would have been. See Congressman Cooley in 100 Congressional Record 8906; Congressman Hope, p. 9161, and the debate on the cotton marketing quota, pp. 9169-72 (all references to the Daily Edition).

[34] 100 Cong. Record, p. 9003 Daily Ed.

[35] *Ibid.*, p. 9157.

[36] *The Nation's Agriculture,* Oct., 1954, pp. 14-15; Congressional Quarterly Log for Aug. 27, 1954.

[37] It could hardly have been because they thought that farmers had punished Republican congressmen. See below p. 619.

[38] Readers should note that this section is based upon voting figures for no smaller units than counties which, of course, include rural non-farm and small town dwellers. However, the common interpretation of the 1948 vote which this section purports to modify also rests essentially on county figures. The writer's associate, Thomas Gilpatrick, is now making an extensive analysis of Midwestern farm voting behavior, using precinct figures.

following states, in which, as already noted, the vote was crucial:

Illinois was Democratic in both 1944 and 1948. Roosevelt obtained 51.5 per cent of the two-party vote for president in 1944; Truman, only 50.5 per cent in 1948. Cook County (Chicago) gave Roosevelt 58 per cent; Truman only 54.5. Nevertheless, claims that the farmers carried the state for Truman are ill-founded. In the first place, Illinois was only 9.8 per cent rural farm according to the 1945 Census. That this fraction of the population could swing the election is doubtful. In the second place, the total vote in fourteen Illinois farm counties, selected to represent the state geographically and by type-of-farming areas, showed 35.6 per cent for Roosevelt in 1944 and 36 per cent for Truman—the difference is negligible. One must conclude that Truman's victory in Illinois can hardly be attributed to a shift in the farm vote.

Iowa was 35.1 per cent rural farm in 1945. Truman squeaked through by 28,000 in an electorate of over a million. Since the state had been Republican in both 1940 and 1944, and since it had so large a rural farm population, the farmers may well have been important in the Truman victory. But how important? The 99 Iowa counties may be divided into three groups: (1) counties with 25 per cent or less of their income from agriculture, (2) counties with 25 to 50 per cent from agriculture, and (3) counties with more than 50 per cent of their income from agriculture.[39] The first are urban counties, the second are small-town dominated, and the third are rural counties. The rural counties shifted considerably toward the Democratic presidential candidate between 1944 and 1948—from about 94,000 for FDR to 102,000 for Truman, a shift of about 8,000 votes. Still Truman came out of these counties with only a 425 plurality over Dewey. Moreover, these 31 rural counties cast only 21 per cent of the total Iowa vote. In the fifty-two counties in between rural and urban, 38 per cent of the total Iowa vote was cast in 1948, and Dewey emerged

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[39] Robert H. Johnson, "An Analysis of Iowa Income Payments by Counties," adapted by Henry J. Kroger, Director of Research, Des Moines *Register-Tribune*, *mimeo.*, 1948.

COMPARISON OF ELECTORIAL MAJORITIES, 1944 AND 1948 IN IOWA COUNTIES DIFFERENTIATED BY PERCENTAGE OF INCOME FROM AGRICULTURE

Per cent of agricultural income	Total Vote Dewey 1948	Dewey 1944	Truman 1948	Roosevelt 1944
25% or less	194,479	212,161	229,747	221,713
25 to 50%	197,790	218,870	190,459	184,186
Over 50%	101,749	116,236	102,174	93,977
Total	494,018	547,267	522,380	499,876

with a 7,000 plurality over Truman.[40] In the seventeen Iowa counties of a more urban nature 41 per cent of the Iowa presidential vote was cast, and President Truman won a 35,000 majority over Governor Dewey.

Consider also the controversy over the grain storage program in 1948. The Democratic victory that year has been partly attributed to the adverse reaction of farmers to the alleged deprivation by the 80th Congress of the Commodity Credit Corporation's power to provide storage space for corn and wheat that farmers wanted to put under government loan.[41] If so, the Democratic gains should have shown up most sharply in the "cash grain" counties, eighteen of which will be examined.[42] Twelve of these counties showed Democratic gains from 1944 to 1948, but five of these were less than one per cent. Thus seven counties showed Democratic gains of more than one per cent; six counties showed Democratic losses of more than one per cent; and five counties stayed practically the same.

The cash-grain counties can be interpreted somewhat differently. Truman got 73,890 votes in these counties in 1948 to Dewey's 66,030; so Truman's plurality was 7,860, a figure of some significance. However, Roosevelt had run up a plurality of 4,261 in the same counties in 1944 —so that the net Democratic gain was only 3,601. In these 18 counties, Roosevelt had received 74,244 votes in 1944 to Dewey's 69,983. Roosevelt got 51.3 per cent of the cash-grain county vote and Truman got 52.8 per cent.

On the face of it, the shift in the cash grain counties was toward the Democrats, but it appears to be so small that it can hardly be credited with securing the Democratic victory. This statement can be made with increased conviction on the basis of the 1952 landslide in which all groups (except for Negroes and those already strongly oriented toward the G.O.P.) shifted markedly toward the Republicans.[43] The landslide of 1952 makes it clear that, in a close election like 1948, it was extremely important that the Democrats activated and held *all* their supporters. Among these supporters, the urban groups, simply because of their pro-

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[40] Note also the table by John Ellickson in Lubell at p. 169, taken from *Wallace's Farmer and Iowa Homestead,* and showing the Republican tendencies in Iowa towns under 10,000 and the relative Democratic propensities of Iowa farmers.

[41] See Oliver P. Williams, "The Politics of Grain Storage: The Commodity Credit Corporation Issue in the 1948 Presidential Election," Ph.D. thesis,, Univ. of Chicago, 1955 (unpubl.).

[42] Using Agricultural Extension Service, Iowa State College, "Background of Iowa Agriculture," *mimeo.;* 1946, Kroeger, *op. cit.;* and George Gallup, *The Political Almanac* (New York: B. C. Forbes and Sons, 1952), pp. 30 ff., Polk County, with Des Moines, is also classified as "cash corn," but is not counted in the foregoing.

[43] Angus Campbell, Gerald Gurin, and Warren E. Miller, "Political Issues and the Vote, 1952," *American Political Science Review,* Vol. XLVII, June 1953, 359 ff. at p. 379.

portionate size were probably more important in bringing about the Democratic victory than were rural groups—even in Iowa.

Ohio was only 12.3 per cent rural farm in 1945. Just as in Illinois, the shift in the farm vote would have to be *very* pronounced to transfer the state from the Republicans to the Democrats. In an electorate of about 3,000,000, Dewey's plurality over Roosevelt was only 12,000; Truman's plurality over Dewey was only 7,000. Truman emerged from the eight cities having 100,000 or more population with a plurality of 131,000 votes over Dewey.[44] Again, and as one would expect, the urban vote was far more decisive than the rural vote in Ohio.

Wisconsin's population was 24.4 per cent rural farm in 1945. In an electorate of 1.3 million the Republican plurality in 1944 was some 25,000. With a slightly smaller turnout the Democratic plurality in 1948 was nearly 57,000. An examination was made of the eighteen southernmost Wisconsin counties, excepting Milwaukee. These counties contain a considerable fraction of Wisconsin's commercial agriculture;[45] therefore, the response of their farmers to policies affecting commercial agriculture should be pronounced. In eight of these counties less than 10,000 votes were cast in 1948; therefore, these must be the most rural counties. They shifted toward the Democrats between 1944 and 1948 by about seven "percentage points" or 14 per cent. Nevertheless, they accounted for only four per cent of Wisconsin's total vote and they gave Truman a total plurality of only 796. In Wisconsin once more this analysis suggests that the farm vote, if it was apparently more influential than in Illinois and Ohio, was hardly decisive in Truman's victory.

4. *Analysis of the Election of 1954*

How the election of 1948 should be interpreted remains somewhat unclear, although in general, Eldersveld's judgment seems to be vindicated that the presidential race again turned essentially on the urban vote. Nevertheless, to practicing politicians and especially to congressmen the rural swing to Truman seemed extremely important. Certainly their subsequent voting behavior suggests this. Many analysts anticipated trouble for Republicans in the farm belt in consequence of their hesitant step toward flexible price supports in 1954. What happened?

First comments hailed the 1954 election as a vindication of Secretary Benson, who made the claim himself, largely on the victory of Martin over Gillette in Iowa and Schoeppel over McGill in Kansas, in both of

[44] George Gallup, *The Political Almanac* (New York: B. C. Forbes and Sons, 1952), pp. 30 ff.

[45] The average value per farm of farm property was $8,400 in Wisconsin in 1940. Of these 18 counties, 15 were above average, 14 being above $10,000 and 8 above $12,000.

which senatorial races the issue of fixed vs. flexible price supports was clearly raised. Many newspapers echoed his claim.[46]

Soon the initial interpretation of a Republican victory in the farm belt was modified.[47] Apparently the most systematic study was made by the *U. S. News and World Report* with the cooperation of *Wallace's Farmer and Iowa Homestead,* the *Wisconsin Agriculturalist,* and other papers. One merit of this study is that it got down below county totals to something much more authentically the "farm vote" by separating, in selected areas, those townships that were 85 or more per cent rural farm in Iowa, 75 per cent or more in Michigan, 80 per cent or more in Wisconsin, and so on. Findings were that in Iowa, Senator Gillette was beaten by small-town and urban voters rather than farmers. In *New York* Senator Ives drew "massive majorities" from farmers but lost in the cities. In *Michigan* Senator Ferguson had the same experience. But in both *Wisconsin* and *Minnesota* farmers swung sharply away from state-wide Republicans—swung enough to elect a Democratic governor in Minnesota and to come within a hair's breadth of doing so in Wisconsin. In *South Dakota's* first congressional district, a radical swing toward the Democrats in the farm vote still fell considerably short of enough to defeat the Republican incumbent. The more farm groups had felt the economic pinch, the more they seemed to vote Democratic (or, perhaps, to switch their vote which, in this section, meant the same thing). Dairy farmers safely within big metropolitan milk markets stayed firmly Republicans; those outside such markets (e.g., in upstate Wisconsin and in Minnesota) tended to vote Democratic. Cash grain farmers were thought to shift more toward the Democrats than corn-hog farmers on grounds that the former felt governmental acreage restrictions more severely and also anticipated price support cuts with greater anxiety.[48]

According to these findings, Republicans maintained their farm strength in both New York and Michigan but lost heavily in Wisconsin and the Dakotas, and moderately in Iowa (although they did not lose any important offices thereby), and lost heavily again in Minnesota (where they gave up one congressional seat and the governorship). Two questions emerge from these election results. First, what motivations really influenced the farm vote? And, second, what are the inferences from analyses of these elections for farm politicians and statesmen?

Let us further examine the influences on the farm vote, postponing the

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[46] See editorials in the *New York Times,* Nov. 6; the Des Moines *Registrar,* Nov. 4; the Chicago *Tribune,* Nov. 4; and a news story in the St. Louis *Post Dispatch,* Nov. 5, 1954. Secretary Benson's statement, issued Nov. 4, 1954 is *mimeo.* USDA 2943-54.

[47] See a news story, "Vote Trend Done on Farm Issues," *New York Times,* Nov. 7, 1954.

[48] *U.S. News and World Report,* Jan. 7, 1955.

second question to the following section. What the actual "determinants" of the farm vote were or are is, paradoxically, at once fairly certain and quite conjectural. The element of certainty arises out of the observed tendency of voters to vote consistently for one party or the other—even with the large pro-Democratic shifts that were reported in the rural midwest in 1948 and 1954, many farmers stayed staunch in their Republicanism. Certainty also is observable in the tendency for the farm vote (and other group votes) to reward incumbent politicians for prosperity and to punish them for economic adversity. No one needs elaborate statistical proof that farmers used the polls in 1892, 1920, and 1932 to make incumbent politicians feel the effect of the hard times.

Elections like 1954 are much harder to interpret, however. Did voting farmers support Benson or oppose him? Did they vote Republican because of Benson or in spite of him? Insofar as their orientation toward Benson was a factor in their voting, were they influenced by his policies or by their "image" of him? How much were farmers influenced by pleas to give Eisenhower a Republican Congress? How much were they moved by arguments that Democrats had been "soft" on Communism? When the pull of traditional partisan ties, the pricks of economic dissatisfactions, the appeal of favorable or unfavorable images of the candidates and of Secretary Benson and of the President, and the stimulation of non-agricultural issues were mixed in their influence on farm voters, what happened? We do not really know. Nor has research methodology advanced sufficiently to provide us with a means of definitely answering these questions even if an elaborate study had been made of the 1954 farm vote.[49]

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[49] This is inferred from Bernard Berelson *et al.*, *Voting* (Chicago: University of Chicago Press, 1954), and Angus Campbell *et al.*, *The Voter Decides* (Evanston, Ill.: Row, Peterson, and Co., 1954). Thus Berelson *et al.* devote Chapters 9 and 10 to the influence of issues on the campaigns. Their conclusions throw some light on the relationships among attitudes on issues, party preference, tendency to vote, and so on. Conclusions familiar to readers of Lazarsfeld *et al.*, *The People's Choice*, emerge, e.g., that the greater the interest voters (in Elmira, New York) had in the 1948 election, the sharper the differentiation among partisans on issues like Taft-Hartley. Some most suggestive findings are made respecting the tendency of voters to perceive their candidate's stand to agree with their own stand on the issues—and also to fail to understand their candidates stand on issues (p. 233). But this study does not indicate that even the panel method lends itself to pin-pointing some question like farmers' attitudes toward price supports and working out the differential effect of this attitude on farmers' voting behavior under varying circumstances. Indeed, the burden of the analysis is in the other direction, namely, that the significance of the several factors respecting voting motivation must be appraised as an inter-related element in a situation each part of which is organically related to all other parts. Moreover, in the summarizing chapter respecting the "Social Psychology of the Voting Decision," the author writes: *"Under the increased pressures of a campaign, people have an increased tendency toward consistency, in all relevant aspects"* (p. 285). Lord Bryce in the *American Commonwealth* put the same idea this way:

5. *Inferences for Farm Politicians and Statesmen*

The writer believes that the public interest was well-served by the bi-partisan, the inter-group, and the inter-administrative negotiations that were taking place after World War II. These negotiations culminated in the congressional hearings on Long Range Agricultural Policy in 1947 and 1948, in the shift in 1947 of the American Farm Bureau Federation to favor flexible price supports and in the Aiken Bill of 1948. As already indicated, both parties accepted this position, although the Southern Democrats were no happier about abandoning 90 per cent price supports than were Southern Farm Bureau leaders. The National Farmers Union, since 1949 an ardent advocate of at least 90 per cent of parity, endorsed flexible price supports in 1948. A few able agricultural economists reject flexible price supports in favor of fixed supports at 90 per cent of parity or thereabouts; but the overwhelming majority of the profession, representing a wide range of political opinion, appears to favor flexible supports.

Another belief underlying this paper is that President Truman's victory in 1948 was interpreted as a consequence of a shift in the farm vote and that this shift was found to be the result of farmers' desire for maintaining both 90 per cent of parity supports and a vigorous Commodity Credit Corporation to make those supports effective. The result, which the writer believes in without arguing that he has "proved" it, was that some Democrats thought that 90 per cent supports was a magic lever to pry a winning majority of farm votes to their side—and that some Republicans became gun-shy of flexible price supports. Enough Democrats and Republicans seem to have reacted in this way to prevent the modification of farm price policy by substituting flexible price supports (and modernized parity) from 1949 until the hesitant and partial step of 1954—a step that was taken only in the presence of huge surpluses of farm

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"Bringing men up to the polls is like passing a steam roller over stones newly laid on a road . . ." (1910 edition, Vol. II, Ch. LXVI, page 253). In other words, as campaigns progress we should expect it to be more and more difficult to ferret out in the *gestalten* of many voters the exact significance of one issue like response to farm policy or to the image of the Secretary of Agriculture—and if we did succeed in ferreting out something by means of a questionnaire we should be extremely suspicious of the "finding." This is why the report of *Wallace's Farmer and Iowa Homestead* of March 19, 1955, that only 24 per cent of a sample of Iowa farmers who had voted Republican did so because of their favoring Secretary Benson whereas 76 per cent did so for other reasons, is misleading if it purports to tell us whether farmers voted approval of Benson. It is most doubtful that farmers can reconstruct their psychological fields of last November, even if they try.

In Chapters VIII, XI, and XII, the authors of *The Voter Decides* consider the problem of issue orientation as related to orientation to candidates and parties; again, the chief insights are those respecting the relationships among these different kinds of "motivation." There is no light here on the exact influence of specific issues on voting behavior.

produce in CCC warehouses and especially of a billion bushel carryover of wheat.

The consequence of the split over farm price supports has not only been bad for the economics of farm policy; it has also been unfortunate for relationships among various groups of farm politicians and public men—specifically, among and between Farm Bureau leaders, congressional farm leaders, administration spokesmen (by no means exclusively in 1949-52), and Farmers Union leaders. Not that a constant blandness is either attainable or desirable in democratic inter-group relationships; nevertheless, a certain level of confidence is a requisite to the maintenance of that "universe of mutual discourse"[50] which seems essential if viable public policy is to be negotiated out of the grinding conflicts of a free society.

If these observations are correct it becomes important to ask whether or not Midwestern congressmen could safely have risked voting for flexible price supports in and after 1949. The evidence suggests that such votes would probably have involved more risk than would the orthodox, conservative[51] votes for 90 per cent of parity. But the evidence also suggests that congressmen could probably have safely accepted the risk. This statement is based upon the previous analysis of the 1948 vote in which, the writer believes, the claims that the farmers elected Truman are fairly well deflated. It is also based upon the fact, already noted, that all eight Iowa congressmen—all Republicans—were re-elected in 1948 by the same comfortable margins that they enjoyed in 1944. When President Tuman chose Iowa to charge the 80th Congress with stabbing the farmer in the back with a pitchfork, why did not Iowans punish these incumbents? In 1950, moreover, Senator Hickenlooper won 56 per cent of the Iowa vote to defeat Al Loveland, who had resigned as Undersecretary of Agriculture to accept the Democratic nomination and who was the avowed champion of price supports at 90 per cent of parity. Evidence is also found in Iowa congressional elections in 1954—while the five congressmen who voted for fixed price supports carried their districts by higher percentages than did the three who voted for flexible supports, they also carried their districts by similar higher percentages in the last previous mid-term election (1950). Moreover, while all Iowa Congressmen declined in their margin of victory between 1950 and 1954, the *average* decline for those favoring flexible price supports was virtually the same as the average for those favoring 90 per cent—between two and three "percentage points."

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[50] As eloquently described in Kurt Riezler, "Political Decisions in Modern Society," *Ethics*, II, Jan., 1954, Vol. LXIV.

[51] Cf. Samuel Lubell's analysis, *The Future of American Politics*, p. 60.

Further evidence that the risk was supportable may be found in the fact that even if farmers "vote their pocketbooks" as so many are so fond of saying—and as is obviously true, so far as it goes—this does not mean that farmers move around in a kind of economic lockstep with price trends. As Walter Lippmann has argued, the Madisonian thesis of the property motivation in politics is often oversimplified.[52] Similarly situated people do not unanimously draw the same conclusion from their economic interests. This observation is borne out in the crude figures we have on the farm vote. If a large number of farmers appear to have left Congressman Dolliver in Iowa's sixth district in 1954, some 57 per cent of them stayed with him. If many farmers apparently abandoned Congressman Lovre in South Dakota's first district, 54 per cent still voted for him. Both men supported 90 per cent of parity in Congress, it is true; but if they had voted for flexible supports and had lost another 10 per cent of the farm vote (which does not necessarily follow, of course) they still should have been re-elected.[53]

Assuming for the sake of the argument that neither congressman voted his deep convictions but rather that each voted according to his sense of expediency, their margins of victory should have permitted them to vote with their party. Nevertheless, it would be asking a great deal of congressmen who are locally based and locally dependent to take this risk. No margin of victory looks too big to a politician; no risk looks too small to be avoided. "Of course," as Alexander Heard writes, "a pitcher with a thirty-run lead . . . can go easy with a one-armed batter, and [Southern] Democrats are playfully generous with the Republicans on occasion."[54] Presumably this trait is universal with politicians; nevertheless, national politicians have a larger chessboard: risks taken here can be compensated there. One concludes that the Republican margins in most congressional districts in the corn belt have been large enough in recent years to afford that party's policy makers some margin to work on in modifying farm policy.

6. *Inferences for Party Responsibility*

"In Great Britain," writes Professor Holcombe, "party government is the essence of constitutional government. In the United States, there is both party government and constitutional government. The connection between the two is complex and obscure. . . . The House, when it functions as a sample of the various interests which constitutes the general

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[52] *Public Opinion* (1922, 1946), pp. 138-39; Cf. Madison. *Federalist #10.*

[53] Both men ran very well in the non-farm sector.

[54] *A Two-Party South* (Chapel Hill: University of North Carolina Press, 1952), p. 76.

public, appears to better advantage than when functioning as a party machine. . . ."[55]

For many years farm policy seemed to be created by what Professor Holcombe calls the "constitutional" process. If the Democratic victory in 1932 set the stage for the Agricultural Adjustment Act, Clifford Gregory described how President F. D. Roosevelt locked farm leaders in a room with the admonishment to come out when they had agreed on a program.[56] O. R. Altman reported the passage of the 1936 Soil Conservation and Domestic Allotment Act: "Secretary Wallace and the farm leaders drafted the legislation, the President blessed it, and Congress made it the law of the land."[57] Farm policy continued to be negotiated among interested groups in agriculture. The process of reaching agreement in 1947-48 has already been hinted. In 1949 the pressing problem of how to scale the cotton allotment down from approximately 27 million to 21 million acres was solved by a series of meetings throughout the cotton belt, from South Carolina to California, with a final get-together at Memphis where an agreement was reached. Congressmen, some of whom had participated in the meetings (along with representatives of the Cotton Council and various other groups), then simply wrote the agreement into law.[58]

In 1954 the process of intra-agricultural group negotiation was apparent in the House debates on the agricultural price support bill.[59] Wheat problems were discussed by wheat congressmen; cotton problems by cotton congressmen; and peanut problems, especially involving efforts to take peanuts off the list of "basic" commodities, were discussed

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[55] *Our More Perfect Union, op. cit.*, p. 189.

[56] "The Farm Bureau and the AAA," *The Annals*, Jan., 1935.

[57] "Second Session of the 74th Congress," *American Political Science Review*, Dec. 1936, at p. 1096.

[58] Cotton stocks were piling up in 1949 so that quotas were clearly in the offing for 1950. Given supplies of cotton, prospective disappearance, and yields, an acreage allotment of perhaps 18 to 19 million acres seemed desirable. But the 1938 Act had been supplemented by wartime legislation that allowed men drafted into the armed services as well as farmers who shifted from cotton crops proclaimed necessary for the war effort to retain their rights to cotton allotments. In consequence, the formula of the 1938 Act, as supplemented, required a national allotment of some 27 million acres. Meanwhile, no cotton allotments had been employed since 1942, cotton production had moved around remarkably, both within states and among states (California had become the fourth largest cotton producer); moreover, records in county and state offices of the Production and Marketing Administration, unemployed for many years to assign acreage allotments to individual farms, were sadly out of date. It was this series of grievous difficulties that the cotton conferences resolved in the "Memphis Agreement." Small wonder that alarm should be expressed on the floor of the AFBF convention in December, 1949, because the Farm Bureau had not taken a leading role in the negotiation. Farm Bureau leaders are always skeptical of commodity organizations, and here was an example of striking success of commodity negotiations, the effect of which would, the speakers presumed, not be lost on farmers.

[59] 100 *Congressional Records*, pp. 8955 ff., 9155 ff., 9680 ff.

by (without meaning any offense) peanut congressmen and by congressmen representing candy-makers who wanted to buy peanuts at lower prices. On dairy and wool questions, however, other congressmen chipped in. Thus some Southern Democrats strongly implied that dairy congressmen had traded out the farm bloc by accepting flexible price supports.[60] On proposals of wool congressmen to take the time limit out of the wool bill, Congressmen Hope (R., Kan.), Cooley (D., N.C.), and Poage (D., Texas), demurred; again, one infers that this reflected some friction arising out of the reported acceptance by wool congressmen of the administration's offer of a special program.[61] Again, the farm bloc thought that it had been traded out.

Farm groups do not wholly monopolize the negotiations on agricultural policy, however. In the late 1930's there was evidence that farm and labor congressmen traded support for annual appropriations for agricultural parity payments and for relief of the unemployed. When the 1940's brought rising farm prices and rising employment, such trading fell off. In 1949 the big city congressmen lent considerable support to the trial run of the Brannan Plan (on which the vote, incidentally, showed a considerable break within the Southern farm group).[62] By 1952, however, a group of New York City congressmen, miffed at the failure of Democratic farm congressmen to support low-rent public housing legislation, announced the formation of an urban bloc to vote against the farm bloc.[63] The threat was carried out on June 30, 1952 in the vote to extend 90 per cent supports through 1954. Eighteen of the twenty Democratic congressmen from New York City opposed this extension; so did three Democratic congressmen from New Jersey, eight from Pennsylvania, and two from Chicago. Had a few more urban congressmen been recruited and had not Midwestern rural Republicans voted in the teeth of the Farm Bureau to extend 90 per cent support, the anti-farm bloc might have succeeded. By 1954, Democratic city congressmen were back in the fold. In the committee of the whole, five of them spoke in favor of 90 per cent supports, usually making the point that they were glad to help Southern Democrats and only hoped that the latter would remember it when Northern urban interests were before the House.

In 1955, with the Democrats in control of Congress, Chairman Cooley of the House Committee on Agriculture warmly praised CIO President

[60] *Ibid.*, pp. 9180 and 9184.
[61] *Ibid.*, pp. 9185-90.
[62] There was a virtually straight party-line vote in the cities, Democrats for Pace's trial run of the Brannan Plan, Republicans for Gore's substitute. At the same time, Georgia, Florida, Alabama, Mississippi, Kentucky, Tennessee, Virginia, and South Carolina voted strongly for Gore; but Louisiana, Texas, and Arkansas tended to support Pace. *Congressional Quarterly Almanac* for 1949, pp. 100 ff.; pp. 177 ff.
[63] *New York Times*, April 2, 1952.

Reuther's statement as "the best farm speech that I have heard in our committee room during the entire twenty years that I have served on the House Committee on Agriculture," and had Reuther's testimony, together with letters from AFL President Meany and others, printed as a House Document and widely distributed.[64]

What emerges from all this? Farm price policy seems to be the product of the interplay of a number of groups. Chiefly these have been farm groups among which the American Farm Bureau Federation has figured importantly but so have other general farm organizations, administrative interests, commodity organizations, and farm congressmen. Sometimes other interests enter the configuration especially urban congressmen and, from time to time, labor interests. In recent years, political parties have apparently become much more significant participants in farm price policy-making.[65]

On the whole, the nonpartisan group process seems to have served the country and agriculture fairly well. Exceptions there have been;[66] but the judgment seems to hold up fairly well and it would be convincingly vindicated had the renegotiation of farm price policy that seemed in the making in 1947-48 been consummated. In the presidential campaign of 1948, however, and in 1949 and subsequent years, an effort was made to make farm price policy-making a partisan matter. From the unfortunate results already noted one would conclude that the effort of the Democrats—at least in terms of the price support level expressed in the Brannan Plan and in terms of the campaign for 90 per cent supports in subsequent years—has been against the public interest. A. N. Holcombe's statement seems to be borne out by this interpretation.[67]

On the other hand, it ought to be pointed out that the established process of inter-group accommodation and log-rolling was not strong enough to repel the incursion of partisan politics, even on the part of one of our

[64] *New York Times*, April 11, 1955 "Farm-Labor Bloc Upsets the G.O.P.," by Joseph A. Loftus.

[65] One commentator on this paper attributes the decline of the group process of policy-making in agriculture to two causes. First, farmers have declined in number and hence in political power; thus the farm bloc loses, and political parties gain, influence. Second, farm organizations are losing their independence and representativeness. Both the Farm Bureau and the Farmers Union have "waxed fat by reason of their business activities." Each is allied with other groups, the Farmers Union leadership with labor, the Farm Bureau with the Chamber of Commerce and the National Association of Manufacturers. The Union, moreover, is identified with the Democratic Party, the Bureau with the Republican Party. Each of these two farm organizations is out to beat the other at all costs—hence the farm bloc is split and the group process of policy making in agriculture is superseded.

[66] John D. Black, *Parity, Parity, Parity* (Cambridge, Mass.: Harvard Committee on the Social Science, 1942), Chapters II, XXIV.

[67] Cf. Ernest Griffith, *Congress: Its Contemporary Role* (New York University Press, 1951), Chapter 12.

political parties that are (supposedly) notoriously weak as policy-making instruments. At the same time, if one concludes that the country would be well-served by a departure from fixed price supports at 90 per cent of parity to flexible price supports, then he will applaud at least this much of the Republican program—and he must acknowledge that the injection of a stronger element of partisanship into farm price policy making can serve the public interest.

In conclusion, the writer believes, somewhat hesitantly,[68] that farm price policy-making is changing, not merely in the configuration of farm groups involved but rather in the inclusion of other participating groups and in a shift in the process itself. A change seems underway from a process dominated by interpersonal and intergroup negotiation to one in which political parties are important and may well become the dominant elements.[69] If this change is taking place, one may hope that the process of farm policy-making produces something more than a mere addition of one group's demands to another's until a winning combination is achieved. As one commentator on this paper wrote: "I think that eventually some broad considerations of national *and* farm interest will prevail over short-run, narrower—and necessarily very much minority—commodity programs. The sum of these commodity programs does not constitute an agricultural policy, and there are too many unresolved, built-in conflicts among them to hold them in equilibrium."

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[68] In general, and not simply in terms of agriculture, party-line voting during the first session of the 84th Congress declined rather sharply in the Senate but increased markedly in the House. A plausible explanation of the differences may lie in the temperaments of the leaders involved, Senator Lyndon Johnson and Speaker Rayburn; if so, it is difficult to speak of the rise of *parties* as factors in policy-making. See the discussion in *Congressional Quarterly Log* for the week ending June 10, 1955, pp. 657-63.

[69] One commentator writes, on the other hand, that "with respect to the trend that you see in the making, it seems to me that we still have to wait for some additional evidence. That is, assuming 1953-55 represent reasonably normal years for American agriculture . . . , following a rather prosperous decade and accompanied . . . by relatively full employment and high nonfarm incomes, . . . the two major political parties [may well remain] fairly evenly balanced with neither actually controlling . . . Congress but both endeavoring to find ways . . . of doing so. Would there be a considerable closing of ranks and a reversion toward the old nonpartisan or more solid farm-bloc type of position if the agricultural situation should continue to worsen over the next several years or if on the other hand it should substantially and immediately improve?"

CONSUMER KNOWLEDGE OF QUALITY DETERMINING FACTORS IN EGGS[1]

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DURING the past few years, a large amount of research has been conducted in the area of consumer preference for egg quality. The basic objectives of this paper are: (1) to question the methodology, analysis, and interpretation of the results of many of these studies, (2) to indicate some of the basic errors that have been made, and (3) to suggest an approach that will permit a more accurate and meaningful evaluation of consumer knowledge.

Misinterpretation of Consumer Preference Research

Studies of consumer preference and buying habits conducted in several cities in the United States have indicated that a majority of housewives express a preference for high quality[2] eggs when asked to choose among a set of colored pictures of the different consumer grades.[3] Several of these studies, designed to evaluate consumer knowledge of egg quality, have relied on this type of preference data to support the conclusion that consumers recognize egg quality. One such study, completed in Ithaca, New York,[4] showed that 66 percent of the housewives visited selected the AA quality eggs as "best" and generalized from this that there was an erroneous assumption among the egg trade that most consumers do not recognize quality.

Preference for albumen thickness is another type of data used to indicate consumer knowledge. Because 52 percent of the Ithaca consumers preferred a thick albumen and gave freshness as the principal reason, it was implied that most consumers were well informed as to the role of albumen condition in egg quality. These findings were, however, not substantiated by a similar study in Rochester, New York[5] in which only 27 percent of the housewives expressed a preference for thick albumen. In the evaluation of consumer knowledge of quality determinants no significance was attached to the fact that a large proportion of these housewives expressed no preference in the matter of albumen thickness.

[1] Contribution No. 865, Rhode Island Agricultural Experiment Station, Kingston, R.I.

[2] "Quality" and "High Quality" when used in this article refer to quality as defined by USDA standards, and do not necessarily relate to "freshness."

[3] Jasper, A. W., *Some Highlights from Consumer Egg Studies,* U.S.D.A., P.M.A. Agriculture Information Bulletin No. 110, June, 1953.

[4] Moore, E. M., *Purchasing Practices and Quality Recognition for Eggs,* Ithaca, N.Y., 1952, Cornell University, A.E. 835, August, 1952.

[5] Moore, E. M., *Purchasing Practices and Quality Recognition for Eggs,* Rochester, N.Y., 1952, Cornell University, A.E. 947, June, 1954.

Too often, the findings of such studies have been interpreted by persons unfamiliar with the limitations of the research, resulting in a wide dissemination of misleading information. To illustrate the point, a Pennsylvania extension release carried the following interpretation: "Consumers recognize quality in eggs. Recent research indicates consumers know egg quality. . . . Studies in several cities indicate that two-thirds to three-fourths of the consumers can identify high quality eggs when they're broken out of the shell. These studies also show that the principal difficulty housewives experience when buying eggs is the inability to find fresh eggs or the quality of eggs desired."[6]

Although this reflects which of the alternative qualities offered has the greatest appeal to the housewife, stated preference for high quality does not demonstrate that consumers can recognize and identify the determinants of interior quality as embodied in the standards established by the USDA. The concept of quality will vary considerably among individual housewives, and may not coincide with any given set of standards. The relevant economic information concerning quality concepts of consumers would seem to be the limits within which they would be satisfied, rather than choice among given alternatives of broken-out eggs or among descriptive terms of albumen thickness. It becomes essential, then, to attempt an empirical determination of consumer knowledge as a basis for generalizing, rather than to derive knowledge from preference data by the process of "implicit theorizing."[7]

Because consumers indicate a preference for high quality eggs, and have difficulty in obtaining the desired freshness in some areas, it is often implied that they demand high quality eggs. This implication, if true, would lead marketing economists and others to continue research in the direction of the further refining of the present consumer grade standards. Most of the consumer preference studies now available are cited in support of the argument for continued effort in closer grading of eggs. Preference is merely an expression of consumer desire and contains no action implications. Demand, on the other hand, is the housewife's willingness to pay a given price for the eggs of her preference. The possible error in equating preference and demand is demonstrated in these same studies by the common consumer complaint about the high price of eggs.

Subsequent sections of this paper present evidence obtained from consumers in Providence, Rhode Island, that demonstrates that preference and knowledge are not synonymous terms, and that very few housewives possess a concept of egg quality that reflects a high degree of awareness

[6] *Poultry Marketing Information*, Pennsylvania State University, Agricultural Extension Service, September, 1954.

[7] Leontief, W., "Implicit Theorizing: A Methodological Criticism of the Neo-Classical School," *Quarterly Journal of Economics*, February, 1937, pp. 337-351.

of the existing quality standards established by USDA. The demand for high quality (AA) eggs is apparently limited to a small group, and nothing of the shape of the demand curve was shown by the preference data taken in the Providence study. Unless the researcher knows the quality differences that consumers recognize and for which they will pay varying prices, nothing can be said about the consumer demand for a particular egg quality.

Studies using controlled experiments to determine the consumer demand for high quality eggs are, at best, inconclusive. In an experiment conducted in five Ithaca, New York supermarkets, Aplin[8] found that consumer acceptance of a "Special Delivery" brand of eggs increased over a 20-week period, and that acceptance at 2-cent and 4-cent premiums above the grade A price was greater than at higher differentials. The demand elasticity for special delivery eggs was 4.87. While one might conclude that this study demonstrates the existence of an elastic demand for high quality eggs, a researcher is equally justified in generalizing that there is an elastic demand for eggs differentiated by brand name.

In evaluating consumer response, Darrah and Henderson[9] conclude that an important proportion of the consumers who buy eggs in grocery stores do not understand or agree with present egg grades, or do not recognize quality as presently evaluated by Federal and State grading standards. The authors concur with this conclusion and take the position that much of the demand for the grade AA egg results not from greater consumer knowledge of egg quality, but rather from a general knowledge that AA is better than A or from the feeling that price is an indicator of quality. Types of data indicating that housewives prefer a high quality egg and that a limited market for grade AA eggs can be exploited cannot logically be offered as proof that the marketing system should incur additional costs by requiring rigid compliance with existing grade standards. Darrah and Henderson considered the added costs in handling grade AA eggs in normal marketing channels and concluded that a price premium of 5 cents a dozen would seem most logical. Assuming additional costs of production and marketing, an elastic demand limits the size of the market for grade AA eggs.

Therefore, cost-incurring adjustments in the marketing system must be justified on some basis other than preference data. To the extent that changes are based on research results, researchers have the responsibility not only to develop sound methodology that will bring out the true facts concerning consumer demand, preference, and knowledge, but also to

[8] Aplin, R. D., *Consumer Demand for High Quality Eggs*, Cornell University, Department of Agricultural Economics, A.E. 834, August 1952.

[9] Darrah, L. B., and Henderson, P. L., *Consumer Response to Egg Quality*, Cornell University, Department of Agricultural Economics, A.E. 923, September, 1953.

make careful evaluations to prevent misinterpretation of the results and to provide the industry with a sound basis for desirable adjustments.

Present Quality Standards

Under the specifications presently advanced by the United States Department of Agriculture, and embodied in the laws of several states, the interior quality of shell eggs depends upon two separate considerations. The first concerns the relative thickness of the albumen and the resultant appearance of the yolk. High quality is denoted by a thick, firm, upstanding albumen when the egg is broken out. Quality loss is indicated by a thinning or spreading of the albumen and flattening of the yolk and is a result of unfavorable conditions of temperature, humidity, and time.

The second consideration involves the presence of foreign matter, principally blood and meat spots, in the albumen or on the yolk of the eggs. Based on the assumption that defects of this kind are undesirable, the specifications state that such eggs will be graded as C quality (the lowest consumer grade) or below, depending on the nature and extent of such defects.

These quality standards have been translated into grade specifications for use in wholesale market channels and for the sale of eggs to consumers.

Problems with Consumer Grades

The need for a grading system to designate egg quality and to facilitate exchange among distant buyers and sellers is obvious. Its desirability in maximizing the efficiency of the marketing system is not questioned here.

However, the system of consumer grades, particularly its narrowness and rigidity as applied on a dozen basis, is of concern to the trade and to consumers, as well as to research and extension people in marketing. To what extent do these grades correspond to consumer knowledge of the important quality determinants outlined in the preceding section?

In this discussion, consumer knowledge is defined as the consistency with which the important quality determining factors appear as answers to a series of questions designed to reveal them. Consumer preference data, on the other hand, reflect the ability of housewives to choose from among a number of alternatives the one that appeals most to them. It should not and cannot be implied from such data that the choices indicate a positive knowledge of quality.

It is undoubtedly true that many consumers who demonstrate a preference for high quality eggs have some degree of quality knowledge. It is also quite possible that such preference reflects experience with high quality eggs and the ability of consumers to recognize the quality to

which they are accustomed. The fact that the average albumen quality of the individual eggs sampled in Providence homes[10] and stores[11] was quite high lends substance to this type of rationalization.

Facts obtained from the consumer studies in Providence indicate that housewives are considerably more lenient in their requirements of egg quality than are present consumer grade standards. In the matter of albumen condition, most housewives did not recognize differences in albumen height equivalent to an entire grade (an average of 29 Haugh Units within the lot) or did not consider them of sufficient importance to change the rating given to eggs within the lot. In addition, the presence of blood and meat spots in individual eggs within the lot did not seem to be objectionable to them. Nearly one-half of the lots of eggs examined by the sample housewives contained one or more eggs with these interior defects. However, only ten per cent of those consumers whose lots contained eggs with these defects registered complaints concerning them.

In the matter of albumen preference, 68 percent of all consumers reported a preference for thick albumen. Freshness or high quality was the reason given for the preference by only 23 percent of these housewives.

Consumer Knowledge of Egg Quality

These facts suggest that most consumers do not have a clear concept of the factors that are considered to be the important determinants of quality and grade. As a result, it was decided to determine the extent or degree to which albumen condition was recognized by the housewife as the principal determinant of interior egg quality. A series of questions designed to reveal the basis for quality judgment were prepared for use in the second consumer survey made in Providence during May, 1952. It was felt that the consistency with which the housewife referred to or recognized differences in albumen condition would provide a rough approximation of the extent of her knowledge. To provide these data, consumers were first asked to rate 6 eggs for table use as they were broken out before them. They were then askd to describe the method by which they determined whether or not an egg was of high quality. Following this, they were shown colored pictures of the four consumer grades of eggs and asked (1) to select the egg they considered "best" and (2) to give the reason for this selection. The questions were arranged in this order, with other questions interspersed to minimize conscious effort by

[10] Taylor, F. R., Owens, A. L., Jasper, A. W., *Consumer Egg Buying, Consumption, and Preference Patterns,* Rhode Island Agr. Experiment Station Bulletin 321, May, 1954.

[11] Owens, A. L., *Egg Quality in Rhode Island,* Rhode Island Agr. Experiment Station Bulletin 317, May, 1953.

the housewife to relate her answers. In addition, consumers were asked to list the specific complaints they had about the quality of their eggs as they were broken out.

Knowledge Analysis

The tabulation of the answers to these questions given by the 300 consumers interviewed is summarized in Table 1. The schedules were first

TABLE 1. EVALUATION OF CONSUMER KNOWLEDGE AS DETERMINED BY THE EGG SELECTED, REASONS FOR SELECTION, METHOD OF QUALITY RECOGNITION, AND BROKEN-OUT RATINGS
300 FAMILIES, PROVIDENCE, R. I.—MAY, 1952

Section	Description of Group	Number and Proportion of 300 Consumers In:									
		Section I		Section II		Section III		Section IV		Section V	
		No.	%	No.	%	No.	%	No.	%	No.	%
I	Total Consumers Interviewed	300	100.0								
II	Consumers indicating a preference for										
	AA egg			151	50.3						
	A egg			67	22.3						
	Total AA and A preference			218	72.6						
	Total B, C, and no preference			(82)	(27.4)						
	Total			(300)	(100.0)						
III	Reasons given for AA or A preference										
	Firm, thick, compact, or upstanding white					80	26.7				
	Firm, high, compact, upstanding or centered yolk					18	6.0				
	Egg holds together, doesn't spread out					70	23.3				
	Total reasons reflecting albumen condition					168	56.0				
	Unrelated to albumen condition					(50)	(16.6)				
	Total					(218)	(72.6)				
IV	Methods of Recognizing Egg Quality										
	Direct reference to albumen condition							72	24.0		
	Yolk characteristics reflecting albumen condition							21	7.0		
	General condition of the entire egg							14	4.7		
	Total methods reflecting albumen condition							107	35.7		
	Total methods unrelated to albumen condition							(61)	(20.3)		
	Total							(168)	(56.0)		
V	Extent to which the ratings of broken-out eggs were varied in relation to differences in albumen height.										
	No variation—identical ratings to all eggs									61	20.4
	Ratings varied inconsistently									30	10.0
	Ratings varied consistently									16	5.3
	Total									107	35.7

sorted according to the preference expressed for particular consumer grades of eggs as selected from the pictures shown them. Section II of the table shows the breakdown of this selection with a total of 218 consumers (73 percent) choosing the AA or A quality egg.

When the reasons given by these 218 consumers were examined, it was found that 168 (56 percent of the sample) indicated that the condition of the albumen influenced their selection, either directly or indirectly. As shown in Section III, a firm, thick, or upstanding white was the reason listed by 80 of these, while another 70 referred to the fact that the eggs did not spread out. The remaining 18 consumers indirectly referred to albumen condition by noting that the firmness or height of the yolk was the reason for their preference.

The remaining 50 housewives who preferred the AA or A eggs gave a variety of reasons for their choice, none of which could be related to albumen condition. One group referred to the general appearance of the egg with reasons such as: good, better, best, or fresh. Another group referred to the condition of the yolk, with reasons such as: light, dark, bright, round, clear, or good looking. A few consumers were unable to give a reason for their preference.

The group of 168 consumers who indicated a preference for the AA or A quality eggs for reasons of albumen condition were separated according to the method by which they recognized whether or not an egg was of high quality. The breakdown of methods is shown in Section IV. Reference to the albumen condition as the method of quality determination was indicated by 107 housewives (36 percent of the sample). Direct reference to the albumen was made by 72 consumers. The remaining 35 housewives referred to characteristics of the yolk or of the entire egg in a manner reflecting albumen condition.

Of the remaining 61 consumers whose methods of appraising quality did not reflect a consideration of albumen condition, a large proportion said they had no idea of how to recognize quality or indicated that they depended upon the source from which they purchased to give them good eggs. A few gave methods such as clear yolks, clear whites, no spots and odor.

It seems reasonable to assume that housewives who show by answers to a series of questions that they recognize albumen condition as the important quality criterion would be sufficiently aware of difference in albumen heights within a sample of broken-out eggs to vary the ratings given to these eggs. Such ratings given by the 107 housewives who had shown the greatest degree of quality recognition are classified in Section V. Most of this group (20 percent of the sample) evidently did not consider differences in albumen height sufficiently important to change the rating. Only 16 housewives (5 per cent of the sample) were found to have used albumen height differences as the basis for varying their ratings. The remainder of those who varied ratings gave no indication that albumen condition was the reason. In this analysis, the average variation

in quality within the lot was not noticeably different among the groups compared.

It has been argued in this analysis that consumer knowledge is a matter of degree, and can be measured by the consistency with which consumers answer a series of related questions designed to reveal knowledge. This analysis demonstrates a method of removing inconsistencies to reveal varying degrees of consumer knowledge and shows that only a small proportion of the total sample revealed a high degree of knowledge that albumen condition is the principal determinant of interior quality. Although 73 percent of the 300 housewives expressed a preference for AA and A quality eggs, a smaller proportion, 56 percent, referred to albumen condition as the reason for this preference. A still smaller group of 36 percent indicated a more precise knowledge when albumen condition as the method of recognizing egg quality was included as a requirement. Finally, a small group, amounting to 5 percent of all housewives, remained when the ability to recognize actual differences in the albumen condition of broken-out eggs was added as an essential factor in determining consistency. From this, it can only be concluded that a small proportion of housewives possess a clear consistent knowledge of the relationship between quality and albumen condition. It also suggests that very few of the consumers who apparently know what they want in their eggs recognize the presence or absence of this factor.

Consumer Ratings

An examination of the process of rating actual eggs by consumers also contributes to an appraisal of the consistency of their knowledge. If most consumers prefer the AA or A quality egg, and if the common reason for this preference is albumen condition, it follows that a large proportion would notice marked differences in the albumen height and would give different ratings to broken-out eggs on this basis. However, when the ratings given to the 6-egg sample by each of the 300 Providence consumers interviewed in the May survey were sorted on the basis of the type of ratings given, it was found that 55 percent gave the same ratings to all eggs in the lot (Table 2). This occurred in spite of an average range of 25.5 Haugh Units[12] among the 6 eggs in the lot and a range of 7 to 78 Haugh Units among lots. An additional 12 percent of the housewives gave no indication of being sensitive to differences in albumen height.

[12] The Haugh Unit system is an index developed for scoring the interior quality of broken-out eggs based on the albumen height adjusted by the weight of the egg. Eggs scoring 79 Haugh units and above are AA quality, while 56 to 78 Haugh units is the A quality range, 32 to 55 the B quality range, and 31 and below the C quality range.

Although they gave different ratings to the eggs examined, their reasons concerned interior defects, yolk color, or source differences.

Thus, it appears that two-thirds of the consumers interviewed apparently did not consider the condition of the albumen of major importance in judging the quality of broken-out eggs, as evidenced by their failure to change ratings according to substantial differences in albumen height. The average quality of these lots was 67.7 Haugh Units which is about mid-point in the A quality range. The average range in quality within the lots was 26 Haugh Units for this group, which was about the equivalent of an entire grade.

TABLE 2. TYPES OF RATINGS, AVERAGE QUALITY, AND AVERAGE RANGE WITHIN LOTS 300 PROVIDENCE CONSUMERS, MAY, 1952

Type of Rating	Consumers		Average Quality in Haugh Units	Average Range within the lot Haugh Units
	No.	Percent		
Identical for all eggs	164	54.7	68.4	25.5
Varied—for other reasons than albumen height	36	12.0	64.2	29.5
Sub-total	200	66.7	67.6	26.2
Varied-consistent	30	10.0	68.2	28.6
Varied-inconsistent	70	23.3	66.8	29.8
Sub-total	100	33.3	67.8	29.0
Total or Average	300	100.0	67.7	27.1

The varied ratings of the remaining 100 consumers were examined to determine the proportion who rated eggs consistently with differences in albumen height and who showed no consistency to this factor in their rating process (Table 2). It was found that only 10 percent of the housewives interviewed gave their best ratings to the higher quality eggs. Neither the average quality nor the range in quality within these 30 lots was noticeably different from the averages of the group.

There was no evidence of consistent attention to albumen condition as a basis for rating eggs by the remaining 70 consumers. On all of these schedules, it was found that lower quality eggs received higher ratings than did those of higher quality. For the group of 36 consumers included with those giving identical ratings, the reasons given reflected specific objections to things other than albumen condition. No such classification could be made for this group of 70.

The average interior quality and the average range observed within the lots as measured in Haugh Units are also shown in Table 2. No great differences in quality were apparent between the two groups or between

either group and the total sample. Differences in average interior quality, therefore, could not be considered as an explanation of the failure of the majority of consumers to vary the ratings given individual eggs. Nor were the differences in the range within lots large enough among groups to be considered an important influence.

Interior Defects

It has been previously stated that the incidence of blood and meat spots in eggs is another major determinant of quality under present standards. With respect to the influence of such defects on consumer grade, this is perhaps a more important quality problem in the New England area than albumen condition. These defects not only reduce the quality rating of the individual eggs, but also have a drastic influence on the consumer grade of the dozen of which they are a part.

TABLE 3. CONSUMER COMPLAINTS ABOUT THE INCIDENCE OF BLOOD AND MEAT SPOTS IN LOTS OF EGGS

Type of Defect Found	Total No. with Defects	Classification of Complaints			Total
		Related to Defect Found	Unrelated to Defect	No Complaints	
			(Percent)		
Meat Spots	177	7	3	90	100
Blood Spots	42	5	7	88	100
Combination	73	22	7	71	100
Total or Average	292	10	5	85	100

Knowledge of this quality determining factor would be indicated by the extent to which consumers recognize such defects as objectionable and complain about their presence. Consumers interviewed in the Providence studies were specifically asked if they had any complaints about the eggs broken out before them. Those who registered complaints were asked the specific nature of their objection. At the same time, the incidence of such defects in the individual eggs were noted by the enumerators. These data are presented in Table 3 for the lots in which defects were found.

Of the 605 lots of eggs examined in consumers' homes, about 48 percent (292) contained one or more eggs with blood or meat spots or a combination of these defects. The defects found were classified by type, with meat spots as the more common type encountered. These lots of eggs were then examined to determine the extent to which consumers registered complaints and whether or not the complaints were related to the defects. In the case of 85 percent of the lots with these defects, no complaints of any kind were listed by the consumer. Objections to the

specific type of defect present were made by 10 percent of those who had a basis for such complaints. Complaints about differences in yolk color accounted for most of the remaining 5 percent.

Implications

From the data presented in the foregoing discussion, three generalizations pertaining to consumer knowledge of egg quality are apparent. It was shown first that most housewives do not consistently refer to albumen condition as the basic determinant of quality. In other words, they do not have a formal concept of what constitutes egg quality, in spite of their indicated preferences for high quality eggs. Secondly, marked differences in the albumen height of broken-out eggs are not noticed or are not considered important enough to make one egg less acceptable than another for a specific use. This fact not only suggests that housewives do not recognize quality differences, but also indicates that they are not aware of existing grade standards. Finally, the frequent occurrence of small interior defects (blood and meat spots) is not objectionable to a great majority of housewives, although the presence of such defects has a pronounced effect on the consumer grade of the dozen in which they occur. Apparently housewives are not as sensitive to the presence of such defects as is generally believed. Certainly this suggests that consumer standards are less precise in this regard than are the exiting consumer quality standards.

Research results of this nature raise fundamental questions in several areas, and demonstrate the need for extreme care in basing action programs on an interpretation of preference data. The continual improvement of grading methods to permit a greater degree of compliance with present standards is the logical direction to pursue, providing the assumptions are valid that consumers recognize and demand high quality eggs. The evidence available from the Providence study suggests that an examination of past research is necessary to determine if the conclusions drawn follow the facts and if they constitute a sound basis for the direction of present and future research. Also, reappraisal of the adequacy of the present system of grades and standards seems desirable.

Grading eggs with the candling light has proved inadequate as a means of removing all of the defects not tolerated under present consumer grade standards. In recognition of this fact, technological research has been directed with considerable success toward the development of grading equipment that will detect the defects that cannot be seen with present methods. There is little doubt that the remaining problems can and will eventually be solved.

However, the successful development of methods of precise quality

measurement will present some short-run economic problems to those involved in the marketing system and to consumers. The wholesale egg handlers will have problems of adapting their grading operations around such new equipment to permit efficient operation. The obvious need for a large volume of eggs to justify the purchase of such equipment could result in a marked change from the present structure of the marketing system. The probable effect would be to reduce the number of wholesalers and jobbers, and to increase the size of the remaining firms. Farmer-retailers, who occupy an important place in New England markets, would be greatly concerned with the effect of a large capital investment in grading equipment upon their competitive position.

Another problem that would face the trade in this situation is that of developing a market for the eggs in the lower consumer grades. At the present time, sales of the lower grades are of minor importance. In Providence, for example, 96 percent of the lots examined in consumers' households were purchased as Grade A with Grade B eggs in limited supply and available only in the national grocery chains. Other types of retail stores offered only Grade A eggs to their customers. In addition, Providence housewives expressed no apparent interest in the purchase of lower grade, cheaper eggs for cooking purposes. With this evidence, it becomes apparent that more precise grading as applied to a given market supply will have the effect of reducing the supplies of Grade A eggs and increasing the quantities of the lower grades. A program to shift the consumer's basis of buying eggs from quality to price and other considerations would be needed to move the entire supply into consumption.

The implications of these problems also extend into the field of poultry breeding for market egg production. Presumably, poultrymen would be paid on the basis of actual grades. With a higher proportion of their eggs falling into the lower grades, market egg producers would be interested in the development of strains characterized by a low incidence of blood and meat spots. Efforts in this direction are now being made.

The results of these developments would tend to be reflected in higher prices of Grade A eggs to consumers, at least in the short-run. A high demand for the improved strains of layers would increase production costs. The introduction of new grading equipment would add to the total costs of marketing. Competition by consumers for a smaller volume of Grade A eggs would result in a higher retail price. Costs would be incurred in creating a market for the Grade B and Grade C eggs.

In the practical sense, additional marketing costs must also be incurred at the retail store level. There seems little reason to perfect methods by which to attain specific quality standards at a given stage in the marketing system if these eggs sold through retail stores are not handled in a

manner conducive to quality maintenance. This situation must be remedied if a quality control program is to be successful.

The obvious question that must be raised at this point is one of the direction that research and educational programs should take if they are to shape properly the future development of the marketing system. The retail egg price reflects the cost of the various services that have been added in the marketing channels. Such services presumably contribute to consumer satisfaction and protection and are demanded by consumers if the costs are to be justified.

At the present time, it would appear that the decision to introduce additional costs into the marketing system in terms of more precise quality measurement has been made, at least in terms of current technological research. It has been shown that the great majority of housewives are not precise in their appraisal of albumen quality, and that they do not object to the incidence of small interior defects. Only a small group was found to possess a clear concept of egg quality as it is embodied in the present standards. These facts suggest to the authors that the introduction of these additional costs would bring about an unnecessary increase in the price paid for eggs by the consumer. The burden of locating a satisfactory source of eggs of a precisely defined quality logically rests with the few individuals who recognize and might demand them.

Quality standards should reflect to producers and other marketing agencies the characteristics that consumers deem desirable in a particular product. The research on consumer knowledge of egg quality-determining factors suggests that this concept is not embodied in the present system of consumer egg grades. Continuing research in the area of consumer knowledge of quality standards is indicated. It is hoped that the probiems raised in this paper and their implications will stimulate sufficient interest to result in a reexamination of the objectives in the development of quality standards and regulations, and to determine proper direction for future research.

THE MEASUREMENT OF CONSUMER PREFERENCES

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THE growing interest of various producer and public groups in the determination of preferences of consumers for various products has opened up new areas of research for economists in many speciality fields. This is particularly true in the field of agricultural marketing. Many products, both in and out of agriculture, can probably be made more satisfactory to consumers by application of knowledge concerning their preferences. Although each product is different so that much preference information concerning one is not applicable to another, there are some unifying principles in the methods of defining and measuring preferences. Out of the welter of differing studies, a few methods of ascertaining preferences are coming into general use. However, there is still a lack of understanding of the relative merits of the various methods in attaining various objectives, and there is disagreement as to what is meant by preferences.

The methods of measuring preferences will continue to be improved for a long time. An imaginative devising of methods fitted for testing his own particular hypotheses is the most fruitful approach for a researcher. However, there is much to be learned from presently developed methods as general guides to solving particular preference problems. This paper attempts to present systematically some general approaches to the solution of preference problems from the economist's viewpoint. An attempt is made to integrate the contributions from several disciplines to the more general problems of measurement and interpretation.[1]

Definitions

A definition of preferences is a prerequisite to their study. The "preference" of a consumer or a group of consumers for a product means that

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[1] For a modern discussion of methodology in the special field of sensory preference and difference testing by trained panels, see David R. Peryam, Francis J. Pilgrim, and Martin S. Peterson, editors, *Food Acceptance Testing Methodology*, Symposium sponsored by Quartermaster Food and Container Institute (Chicago: National Academy of Sciences–National Research Council, 1954); and M. M. Boggs and H. L. Hanson, "Analysis of Foods by Sensory Difference Tests," *Advances in Food Research*, E. M. Mrak and George F. Stewart, editors (New York: Academic Press, 1949), II, 219-58. For an extensive review of literature and bibliography of sensory testing see Elsie Dawson and Betsy Harris, *Sensory Methods for Measuring Differences in Food Quality*, U.S.D.A. Agr. Info. Bul. No. 34, pp. 1-134.

in a *given situation* that product is the most desirable of two or more alternatives. This definition is in general conformity with the usage of the word prefer and has general applicability in various situations. For example, a "preference" is obtained when a consumer inspects or tastes two or more products and indicates the one "liked best." A preference is obtained in a different situation when a store customer inspects two or more products displayed together in matched-lots and buys one of them. A preference would be obtained in a still different situation if the prices of those matched-lot products were different from the previous situation. Preferences cannot be interpreted without being related to the situation in which obtained. The fact that 75 percent of consumers prefer product A to product B in an eating preference test should not be interpreted to mean that 75 percent of consumers will buy A rather than B when they are sold in matched-lots with A priced higher than B. Neither of those situations should be interpreted to mean that the volume of sales of A would be higher than those of B if either product were to be sold alone with A priced higher than B. Some very important things can be learned from determining preferences in any one of those situations, but the preferences are not the same in them. An important maxim in the measurement of preferences is to determine the particular situation or situations in which preferences can be feasibly ascertained, to select the one or ones desired, and to interpret the results accordingly.

There has been some controversy about the concept of "product acceptance" and its relation to consumer preferences.[2] A definition which is in general agreement with some other definitions and is consistent with the above definition of preferences is the following: the "acceptance" of a product means the extent to which it will sell in a given market situation or will be consumed in a given eating situation. Almost all economic studies of acceptance have been in terms of a market situation but many studies of products by technologists are in terms of whether or not the products are palatable enough to be accepted (i.e. consumed) by consumers or by members of the armed services.[3] Thus, acceptance has an absolute denotation while preference is a purely relative term.[4] To say that product C is less preferred than product A does not indicate whether any consumers will buy product C or not, nor does it indicate whether any members of an institution will generally consume C or not. However,

[2] Cf. Glen Burrows, "Consumer Acceptance or Consumer Preference," *Agricultural Economics Research*, 4:52-56, 1952.

[3] Cf. David Peryam and Norman Girardot, "Q M Pins Food 'Likes' and 'Dislikes' with Advanced Taste-Test Method," *Food Engineering* 24:58, July, 1952; W. F. Dove, "Food Acceptability—Its Determination and Evaluation," *Food Technology*, 1:39-50, 1947.

[4] The "palatability" scoring of food products by trained panels often appears to have both an absolute and a relative denotation for the researchers.

in the marketing literature, *relative acceptance* is usually stressed, and acceptance of various products refers to the relative volume of sales of those products in comparable situations. Product A may be preferred by most people over product B and yet not be significantly more acceptable. An example is cited of a study of waxed and non-waxed potato sales in which the waxed significantly outsold the non-waxed in matched-lot sales but in which the sales of either when displayed alone were not significantly different.[5] Consumers indicated a willingness to allot a major share of their potato expenditures to waxed rather than non-waxed potatoes. Consumers did not indicate a willingness to change the share of their total expenditures allotted to potatoes.

The relationship of market studies of acceptance and preference can now be developed. The ordinary preference study compares two or more products that are very much alike (all are potatoes, or all are beef roasts, or all are vanilla ice creams) and determines preferences. The acceptance study "compares" two or more alike products with other competing commodities to determine not only if potato A is preferred more often than potato B but also if potato A is preferred more often in relation to meat, canned food, children's clothing, and other competing products than is potato B. This is a "comparison" in the relative expenditure sense illustrated by the waxed potatoes example and is not, of course, a literal comparison of unlike products.[6] Thus, the acceptance study is a "preference" study embracing a much wider set of alternatives than the "limited" preference study and provides the basis for broader conclusions. Conclusions from the limited preference studies can be extended to acceptability problems only under careful restrictions.

These definitions are fundamental to the methodological analysis that follows because they help to distinguish and classify certain problems. The particular definitions, though based largely on the past usage of the terms, may or may not be deemed most appropriate.

Differing Objectives

Much of the literature on preference and acceptance studies is rather confusing until it is realized that there has been a difference in objectives among the studies, though the difference does not appear to have been explicitly mentioned. Many preference and acceptance studies have as their objective the selection of *one* of several alternative products as the product to be merchandised to a certain customer population. The problem may be one of product composition; e.g., should our brand of fish sticks be treated with monosodium glutamate or not, or which one of these three types of catsup will compete best with our competitors'

[5] Burrows, *op. cit.* pp. 55-56.
[6] Cf. *Ibid.* for discussion of methods of measuring acceptance.

brands. The problem may be one of merchandising selection for the wholesaler or retailer as to which one of several brands of this or that product shall be handled. Some other preference and acceptance studies are concerned with *merchandising two or more products simultaneously.* For example, the student of beef grade preferences realizes that there are five different grades of block beef now being merchandised. Many retailers have the problem of which one grade of beef to merchandise. Other retailers have the problem of which and *how many* beef grades to merchandise. On the national level, there is the problem of how many beef grades to establish and where and how to merchandise them. These two very different problems require different methods of investigation and analysis.

This simple but important distinction in objectives of both preference and acceptance studies indicates a need for differing methods of analysis and presentation. Unfortunately, this distinction has often been obscured. The generally prevalent methods of analysis emphasize the one most popular product. This emphasis may be given by counting first preference choices or by computing volumes of sales and calling the most popular product "the preferred" product. Sometimes "no preference" answers are ignored or even thrown away and the conclusion is: "A is preferred." This emphasis may be given by obtaining consumer ratings of the products (or converting consumer rankings to scores) and considering the product with the highest average score to be "the preferred" product with the added provision, sometimes, that analysis of variance shows that average to be significantly greater. The emphasis has also been given by the use of an "m rankings" correlation method that measures the extent of concordance of m observers on all N ranks of n objects. The relative merits of these techniques in selecting the one most popular product are much too complicated to be evaluated in detail here.[7]

Two points need to be emphasized. The first point has already been made that these methods are appropriate in varying degrees to the selection of the one most popular product, but are not the full answer to the broader problem of simultaneous marketing of several products. The second point is that these methods need to be applied carefully in terms of the information desired. The fact that product A's average preference score is found to exceed "significantly" product B's average preference

[7] Cf. L. L. Thurstone, "Experimental Methods in Food Testing," *Journal of Applied Psychology*, 35:141-45, 1951; C. I. Bliss, Mary Greenwood and Margaret McKendrick, "A Comparison of Scoring Methods for Taste Tests with Mealiness of Potatoes," *Food Technology* 7:491-95, 1953; George H. Brown, "Measuring Consumer Attitudes toward Products," *Journal of Marketing*, XIV (April, 1950), pp. 691-98. For a detailed discussion see V. James Rhodes, "A Theoretical and Empirical Investigation of Consumer Preferences for Beef by Grades in Metropolitan St. Louis, 1954," Ph.D. thesis submitted to Harvard University, April 1, 1955.

score does not necessarily mean that more people prefer A than prefer B or that more of A will be sold than of B. Moreover, there appears to be no reason why the interpretation "A is preferred" or "A is significantly preferred to B" should be applied to *all* the following cases: case one in which 50 percent of the subjects prefer A, 40 percent prefer B, and 10 percent have no preference; case two in which 90 percent prefer A, 0 percent prefer B, and 10 percent have no preference; and case three in which 25 percent prefer A, 10 percent prefer B, and 65 percent have no preference. Not only is much information thrown away in such a simple statement, but also these three sets of results are likely to mean very different things to a company that is trying to decide which product to merchandise or whether or not to replace old, well-accepted product B with new product A.[8] Confusion would be reduced by restriction of the terms prefer and preference to the actual preference situations as previously defined and the use in summary statements of "A is more popular than B (case one: 50:40:10)" or "A is more popular than B but most consumers have no preference (case three: 25:10:65)," rather than simply "A is preferred to B." Even the distinction that "the *modal* preference is for A (50 percent prefer A, 40 percent prefer B, and 10 percent have no preference)" appears to be much more satisfactory than the indiscriminate use of the term "preference."

Another confusing interpretation of preference results may sometimes be found. Assume that it is found that 45 percent of consumers prefer A and 48 percent prefer B and that the percentages are not significantly different. In this situation it is sometimes concluded that "there is no preference between A and B." This conclusion can be quite misleading inasmuch as preferences may be very strongly held in this case by a total of 93 percent of the panel—as contrasted with 65 percent of the panel with no preferences in case three above—and may motivate the user of the research to quite different actions than would have occurred if not one single individual preferred A over B or vice versa.

In this infancy period of preference research it is anything but pedantic to insist on clear specification of objectives and results of "preference" research. The simple conclusions "A is preferred to B" or "A is not preferred to B" have been attached to various and sundry data in a completely contradictory fashion in some instances.

Uni-Product Selection

The problem of choosing one of several alternatives to be merchandised may be attacked by several techniques. While space limitations prevent a detailed analysis of these techniques, some useful general prin-

[8] As has been indicated, these percentages are not ordinarily a sufficient answer to a given practical problem. The plea here is simply for straight-forward presentation of results.

ciples can be indicated. Van Waes has given probably the best and most comprehensive discussion of the various sales methods.[9]

The Latin square sales method is an acceptance type of study that can answer very efficiently the question of which single product to merchandise to a given population. It should not be used for certain products, however, because its results may be biased if sales of the test products are largely a function of sensory satisfaction with previous products of that type and if consumers are not able to predict sensory satisfaction on the basis of visual inspection of the products. The optimum length of time periods used in the Latin square may vary with the products tested. Much more experience with the method is needed before it can be properly evaluated.

The Latin square sales test is said to be difficult and expensive as compared with the matched-lot test[10] and yet is little more informative in two out of the three following cases. (1) If the test products are all the same cost, or (2) if the product selling most rapidly is the cheapest, then the relative sales in a matched-lots test indicate that the merchandiser has nothing to lose and probably something to gain in selling the most popular product. This is not as pretentious as assuring the merchandiser that the most popular product will have 6.1 percent greater sales than the next most popular product, but the value of the advice to the merchandiser may be little different and is likely to be obtained much more cheaply.[11] (3) If the most popular product is the most expensive product to merchandise, then a limited preference study such as the matched-lot test provides an insufficient basis for decision as to which product to merchandise. In this case, the difficult Latin square or the matched-store (control store vs. test store) test[12] may be used for appropriate products or "educated guesses" may be made from limited preference studies of a visual or sensory nature. An accurate evaluation of the monetary strength of preferences may make those "guesses" fairly reliable. Improvements in methodology are needed in this area.

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[9] However, several exceptions are noted in this paper to the evaluation of various techniques by Van Waes who presented a quite optimistic view of the Latin square method. D. A. Van Waes, *Methods of Research in Marketing: Evaluation of Research Techniques Used for Measuring the Influences of Factors Believed to be Associated with Volume of Consumer Purchases in Retail Stores*, Paper No. 1, Dept. of Agr. Econ., Cornell, July, 1951.

[10] Van Waes, *op. cit.*, p. 41.

[11] Recommendations from situations in which the price difference was apparently non-existent or unimportant may be found in various studies. Cf. Cornelia Tyler, "Better Artificial Vanilla Flavor," *Food Engineering*, 25:62 ff.; John Nair, "Mass Taste Panels," *Food Technology*, 3:13-36; George Garnatz, "But What do the Consumers Say?" *Food Industries*, 22:1333 ff.; Dean Foster, "Use of MSG at Proper Level Doubles Products' Consumer Acceptance," *Quick Frozen Foods*, XVII (October, 1954), pp. 51-52.

[12] Cf. Van Waes, *op. cit.*, pp. 31-35.

Interviewing studies of preferences may be used in the selection of one alternative product for merchandising in cases (1), (2), and sometimes, (3) above. These interviews may be based on visual displays or on actual consumption of the products.[13] These interviews have often been conducted in homes although they have sometimes been conducted at fairs or in stores or other public places. Sampling problems are difficult if interviews are conducted outside the homes. A whole range of problems concerning question bias are encountered in interviewing. Interviewing problems, however, have sometimes been too readily dismissed as unsolvable. The careful use of displays or consumption of test samples greatly reduces many interviewing problems, though other important ones still remain. Researchers in private industry and in other disciplines have used interviewing and especially sensory tests to answer many problems in this field.[14]

Most users of research are more interested in relative consumer expenditures than in the actual proportions of consumers expressing preferences. The correlation of expenditures with numbers of consumers varies with the products and the population selected for study. The correlation would be greater for potatoes than for diamond rings in a sample of an entire metropolitan population. The correlation of number of consumers and amount of consumer expenditures, however, could be improved by restricting the sample and by ascertaining consumer income and purchase intentions relative to diamond rings. Predictions of relative sales from interview data can be only approximations at best and should not be made at all for some products. Even in the latter case interviewing may be useful in order to ascertain the "why" of preferences and to learn more about consumption patterns.

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[13] A few have been performed without any display and are based on memory of the respondents concerning the products. The range of products on which these tests can be successful is probably rather limited.

[14] For a somewhat critical view of interviewing problems see R. L. D. Morse, "Rationale for Studies of Consumer Food Preferences," *Advances in Food Research*, E. M. Mrak and George F. Stewart (editors), New York: Academic Press, 1951, III, pp. 386-430. Morse largely ignores the obtaining of sensory preferences in his discussion, however. Good introductions to methods of meeting the simpler problems of schedule design are found in L. O. Brown, *Marketing and Distribution Research* (New York: Ronald Press, 1949); Stanley Payne, *The Art of Asking Questions* (Princeton: Princeton University Press, 1951); Committee Report, "Questionnaire Preparation and Interviewer Technique," *Journal of Marketing* (October, 1949), pp. 399-433. Examples of well-tested schedules for sensory preference testing may be found in Nair, *op. cit.;* Washington Platt, "Some Fundamental Assumptions Pertaining to the Judgement of Food Flavors," *Food Research*, 2:237-49; George Garnatz, "Consumer Acceptance Testing at the Kroger Food Foundation," *Proceedings of the Fourth Research Conference* (Chicago: American Meat Institute, 1952); Peryam and Girardot, *op. cit.* A recent experimental study of interviewing bias is J. J. Feldman, Herbert Hyman, and C. W. Hart, "A Field Study of Interviewer Effects on the Quality of Survey Data," *Public Opinion Quarterly*, 15:734-61.

Multi-Product Selection

The problem of selecting *how many* and which products to merchandise among a group of alternatives is a complex one encountered in many graded agricultural commodities as well as in other lines. Some attacks have been made on this multi-product problem with the methods used above with no recognition of the inappropriateness of the various methods. One can find studies of beef grade preferences in which it is concluded that "consumers prefer blank grade" when the data clearly show that a plurality of consumers preferred that grade but a majority of consumers were split up in groups preferring other grades. The relative popularity of the grades (types, brands) of the product is of interest to the retailer but this is hardly a satisfactory solution on the national level where several grades are to be merchandised. Solution of the problem involves various areas of research. The national consumer demand for the various grades of beef, for example, is affected by the particular grades handled by the tremendous number of institutional buyers and beef retailers. At the same time retailers have to decide which grade to handle and whether or not they have sufficient volume to handle two or more grades. Handling more than one grade involves not only problems of counter and cooler space but also problems of advertising and selling. If a retailer wants to handle two grades, he must decide how to enable consumers to distinguish between them so as to obtain maximum consumer satisfaction.

The method of measuring who prefers what product has been implemented by tabulation of "first" preferences (first rank or highest rating in interviews) or of sales volumes in relation to the consumers concerned. The analysis has been extended to second or last preferences with interview data—sales tests do not produce such data—without any great apparent increase in usefulness of the results.[15] These simple techniques will probably be improved in the future, but it appears that improvement does not lie in the direction of analysis of variance and "average consumer" types of analysis for this problem of multiple product preferences and consumption.

Solution of these problems depends upon measuring the "economic strength" of preferences. The economic strength of preferences refers to the extent to which the preferences among a set of products are a

[15] "Style goods" may be an exception to this. Cf. Lyndon O. Brown, *op. cit.*, p. 555, on the Chrysler Car example. A new method of analyzing preference ratings by classifying respondents into "like" and "dislike" categories appears to use all ratings without using the objectionable average consumer concept. For a brief discussion of this analysis as a way of overcoming the masking of preference patterns by use of mean ratings, see James A. Bayton and Hugh P. Bell, "Preferences for Canned Orange Juices That Vary in Brix-Acid Ratio," Marketing Research Report No. 76, December, 1954.

function of their price relationships. As a case of "weak" preferences, suppose that 70 percent of the potential buyers prefer A to B at equal prices per unit of each but that only 20 percent of those buyers prefer A to B if A is priced two cents higher. The extreme case of "strong" preferences would be found in a case where only the preferred product would be purchased regardless of how cheaply the competing products are priced. Most preferences probably have an "economic strength" somewhere between these extremes. This strength is very relevant to the problem of which and how many grades (products) to market to a customer population of divergent preferences. Although the economist by force of training may be quick to perceive this problem, it appears quite difficult to solve with great accuracy. The obtaining of "willingness" to pay various differentials by interview cannot be expected to be more than approximately correct at best.[16] The selling of products at various prices encounters the problem of having injected additional attributes of "quality guide" and of "prestige" into the situation for some buyers. Methodological improvements are needed in this area. However, both the present methods can make a contribution if interpreted carefully.

The reader will note that the determination of the economic strength of preferences was particularly important in the uni-product selection problem in the third case only. However, such determination is important among the whole set of products in a multi-product marketing situation. The price relations and the market channels for all the products need to be estimated.

Care must be taken to insure that preferences are determined for the specific population concerned.[17] This seemingly obvious fact needs to be kept very clearly in mind in the problem of determining who prefers what product or the problem of which and how many products to merchandise. For some products the population's preferences and the merchandising conditions may be so heterogeneous that the population to be studied must be limited to the potential customers of a given merchandiser. A multiple store sales study, such as the matched-stores or Latin square designs require, or a city-wide interviewing study would be inappropriate. The selection of the population to be studied merits considerable study in relation to this over-all problem.

No Preferences

The consumer with no preference is often ignored or "condemned" in the analysis of preferences. The average consumer type of analysis has

[16] See an interesting example by George Garnatz, "Consumer Acceptance Testing at the Kroger Food Foundation," *Proceedings of the Fourth Research Conference* (Chicago: American Meat Institute, 1952).

[17] Washington Platt, "Some Fundamental Assumptions Pertaining to the Judgement of Food Flavors," *Food Research*, 2:237-49, 1937.

the "no preferences" well hidden in the statistical means. The simple tabulation of first choices is sometimes given without even mentioning "no preferences."[18] The extent of "no preferences" is not easily measured, however, even when the importance of "no preference" is recognized. Ranking appears to create an interviewing atmosphere in which most "no preferences" are not reported.[19] The commonplace experience of many opinion researchers is that most people feel obliged to have opinions on any subject asked them.[20] The obtaining of price differentials among test products that the respondent indicates a willingness to pay will reveal price ratios at which he is indifferent, and will probably reveal more "no preferences" at equal prices than ranking or scoring indicated.[21] In addition to the glossing over of "no preferences" encouraged by the difficulty in measuring them, there appears to be opposition of some product specialists to the whole concept. A thorough training in the merits—technical, organoleptic, etc.—of a set of products may lead to the conviction that consumers *must have* preferences among products concerning the many and varied attributes of the product.[22] The indifference analysis training of the economist should lead him to avoid this error.

Product Improvement

The improvement of products has characteristically been a concomitant of many preference studies. Various methods have been used. Respondents may be asked reasons for use or non-use of a particular product or group of products. Consumer preferences may be obtained by sales or interview for products which are identical except for variations in a particular attribute. Also, more complicated analyses may be used.[23]

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[18] Some panel studies either throw out "no preferences" or divide them proportionately among the preferences.

[19] Cf. Rhodes, *op. cit.*, pp. 170-75.

[20] Cf. the good discussion of this point in Stanley Payne, "Thoughts about Meaningless Questions," *Public Opinion Quarterly*, 14:687-96, 1950.

[21] Cf. V. James Rhodes, Elmer R. Kiehl, and D. E. Brady, *Visual Preferences for Grades of Retail Beef Cuts: A Study Conducted in Metropolitan St. Louis*, 1954, Missouri Research Bul. No. 583.

[22] The interpretation of no preferences or "wrong" preferences as sufficient bases for education of consumers as to "right" preferences is an everpresent danger that should be of concern to preference researchers.

[23] Brown and Banks have applied multiple correlation and the linear discriminant technique to the analysis of a matrix of preferences for attributes of branded products. Consumer attitudes toward various product attributes were measured by ratings. The relative importance of these attitudes toward attributes as influences on purchase or non-purchase or on over-all preference ratings was estimated and provided a guide for recommendations as to changes in products to improve their acceptability. George Brown, *op. cit.*, pp. 691-98; Seymour Banks, "The Relationships between Preference and Purchase of Brands," *Journal of Marketing*, XV (Oct., 1950), pp. 145-57. For somewhat similar attempts to relate consumer or small panel attitudes to physical measurements of product attributes see, G. A. Baker and M. A. Amerine, "Organoleptic Ratings of Wines Estimated from Analytical Data," *Food Research*, 18:381-89; E. L.

Product improvement may sometimes result from changing the product to unfamiliar forms. These new products may be tested against well-accepted ones in visual or sensory preference tests as mentioned above. The preferences of a group of consumers may sometimes change with their continued experience with the new products, or with the greater acceptance of the products among other consumers. Thus, there is a whole area of dynamic preference determination that is quite important in commercial research and appears to have real potentialities in publicly-financed research on some products.

Integration of Visual and Sensory Preference Research

Preferences of consumers have been expressed on the basis of visual or other sensory stimuli.[24] The published studies of economists appear to have been almost entirely based upon recall or visual stimuli. Their visual basis for obtaining preferences has been photographs or actual displays of the test products including sales displays. Apparently it is assumed either that a full appraisal of the products' desirability to the consumer can be obtained by his inspection, or that the sensory aspects of their relative contributions to his consuming satisfaction can be accurately associated with their visual appearance from memory of previous experiences. Some products, such as certain types of packages, could be easily classified as fulfilling the first assumption. Others, such as very standardized brands of canned corn, very likely fulfill the second assumption, and still others, such as food products with which a consumer is not familar, probably do not fulfill either. There may be other products where it is not at all apparent which assumption, if either, is realistic. Also, there may be products that only a small unknown proportion of consumers can really evaluate visually, though most consumers may think they can. Unfortunately, the distinction between visual and sensory preferences has been rarely made explicit.

Most sales tests of preferences depend entirely on visual stimuli. Many published reports show that sales experiments have been too brief for the influence of consuming satisfaction with previously purchased test products to have affected relative sales appreciably. The Latin square sales test depends upon a rotation of test products. This would likely prevent consuming satisfaction from *correctly* influencing relative sales

Quenon, "A Method for Pre-Evaluating Merchandise Offerings," *Journal of Marketing*, XVI (Oct. 1951). A good discussion of the issues involved in the latter method are found in Oscar Goodman, "A Note on 'A Method of Pre-Evaluating Merchandise Offerings,'" *Journal of Marketing*, XVII (July, 1952), pp. 47-51; and a "Rejoinder" by Quenon, *Ibid.*, p. 51.

[24] The interviews based only upon recall are mentioned above. Vision is one of the senses, of course, but this visual versus sensory distinction has been made in previous literature on trained panels.

of some test products if special care is not taken to notify consumers of the changes in product from time to time. Both the matched-lot and the matched-store tests appear to be good measures of the total influence of visual appearance *and* consuming satisfaction if conducted over a sufficiently long period. It must be remembered, of course, that each of these tests is appropriate to certain problems, as discussed already. For many products preferences can probably be determined adequately by visual stimuli in sales tests. The sales test is a very important method of research when it is used appropriately.

In contrast with the typical approach of the economist, the researcher with a food technology background has typically used taste tests or other sensory tests such as odor tests. Small panels of "consumers" have sometimes been used and results from an "expert" panel have sometimes been inferred too freely to consumers. However, commercial researchers appear to have achieved quite satisfactory results with preference taste tests of large groups of consumers.[25] The Quartermaster Food and Container Institute for the Armed Forces has performed a tremendous amount of taste preference and acceptance research since the early 40's—apparently, with considerable success.[26]

These sensory preferences must be interpreted, of course, relative to the situation in which obtained. As mentioned already, an eating preference for product A over product B is only indirect evidence as to which product will be purchased if A costs more than B. At the same time such an eating preference is a good indication of which product will become more popular if they are priced the same.[27] Determination of sensory preferences helps to solve various problems in the field of competition by product differentation and innovation. Such types of nonprice competition have been of special interest to economists for 25 years.[28]

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[25] For many examples of successful tests and good discussions of techniques see Washington Platt (ed. of Symposium), "What the Manufacturer Can Learn from Consumers about Foods," *Food Industries*, 13:39-50; Norman Ishler, Elsie Laue and Anna Janisch, "Reliability of Taste Testing and Consumer Testing Methods. II Code Bias in Consumer Testing," *Food Technology*, 8:389-90; George Garnatz, *op. cit.*, pp. 1333 ff.; John Nair, *op. cit.*, pp. 131-36; E. L. Jack and Vesta M. Haynes, "Consumer Preference for Bread Containing Different Levels of Non-Fat Dry Milk Solids," *Food Research*, 16:57-61; E. A. Fleishman, "An Experimental Consumer Panel Technique," *Journal of Applied Psychology*, 35:133-35, 1951.

[26] Peryam and Girardot, *op. cit.*, pp. 58 ff.; George P. Tuxbury and David Peryam, "The Application of Food Acceptance Methods and Results to Military Feeding Problems," *Proceedings of the Fourth Research Conference* (Chicago: American Meat Institute, 1952).

[27] Such inferences are restricted by the relationship of number of preferences and amount of expenditures as discussed above.

[28] Cf. Edward Chamberlin, *The Theory of Monopolistic Competition* (6th ed. Cambridge: Harvard University Press, 1950), Ch. IV, V and Bibliography.

The economist needs to learn more about sensory testing of preferences and to apply the tests to products where such methods either appear to be more appropriate than the visual tests or to be of important complementary value.[29] More evaluation is needed of the relative importance of visual and sensory preferences for various products. Better methods are needed for relating sensory preference tests to the over-all preference problems. The large survey techniques with which the economist is familiar may be fruitfuly combined with methods of eating tests as adapted from the food technologists and the psychologists who experiment in perception.

Trained Panels in Preference Research

Trained panels can be an important adjunct to the preference researcher—if correctly used. The small panel of experts is a cheap, convenient way of ensuring that there actually are noticeable differences of an organoleptic nature in the products to be tested by consumers. If preference research is conceived solely in terms of *given* products there may be no need or no possibility of reducing the number of products to be tested by consumers. However, products should not always be taken as given. Many product variations may possibly be more acceptable to consumers than the traditional products. Heterogeneous food products classified by out-dated grading systems may not be classed in homogeneous groups which can sensibly be compared to obtain consumer preferences. The expert panel is an economical way of testing the approximate sensory homogeneity of grades as an aid to specifying the products which are to be tested in the field. A panel may also furnish a crude approximation to consumer preferences, so that the objectionable foods may be eliminated without the trouble of testing many consumers.[30]

A panel can sometimes be used to measure the acceptance of a new product by comparing it with an already accepted standard. This standard may be the most popular competing brand or it may be a different form of the same product. For example, reconstituted dried foods or foods that have been frozen or stored in various ways are compared with the fresh product. The goal may be to develop a product that a panel cannot distinguish from the product of proven acceptability.[31] Or the goal may be

[29] Differences in appearance are often masked during eating tests and are evaluated in separate tests.

[30] For examples of the latter use of panels, see Barbara Kennedy, "Food Preferences of Pre-Army Age California Boys," *Food Technology*, 6:93-97; Peryam and Girardot, *op. cit.*

[31] It is assumed that most consumers will not detect the difference in products if a trained panel cannot. For examples, see: Royene Owen and Frances Van Duyne, "Comparison of the Quality of Freshly Baked Cakes, Thawed Frozen Baked Cakes, and Cakes, Prepared from Batters Which Had Been Frozen," *Food Research*, 15:169-

to develop a new product that is more preferred than the standard product. There is considerable risk in assuming that the preferences of a panel are representative enough of the consuming population to be relied on in anything more than preliminary testing of a new product. Also, there are other problems. Absolute acceptance ratings are influenced, for example, by the relativity of human judgments. Mediocre tasting product A may seem acceptable if tasted with poor tasting product B but may seem quite unacceptable if compared with good tasting product C instead.[32]

Some interest has developed in applying preference results in agricultural commodities to the problem of designing or revising consumer grade standards. Goals and methods for giving a really complete answer to this problem have apparently not been developed. The use of the sensory discrimination test among consumers to determine the limits of each organoleptically homogeneous grade appears to be an exceedingly fruitful and almost completely unexplored field.

Summary

Research in preferences is being conducted by an increasing group of workers with widely varied backgrounds. Increasing self-criticism and integration of the contributions of various disciplines is needed. This paper attempts to examine the broad issues from the economist's viewpoint. Specifically this paper presents:

(1) a conceptual relationship of "preference" and "acceptance";
(2) an important dichotomy in objectives of preference research;
(3) an outline of the methods which are or are not appropriate for those objectives;
(4) basic limitations of certain sales and interviewing research methods;
(5) an argument for the greater use of sensory methods of research and an introduction to the growing literature on that subject contributed by food technologists, psychologists, and commercial researchers.

78; B. B. Bohren and Ruth Jordan, "A Technique for Detecting Flavor Changes in Stored Dried Eggs," *Food Research*, 18:583-91; J. C. Hening, A. C. Davis, and W. B. Robinson, "Flavor and Color Evaluation of Canning Crops Grown of Soil Treated with Insecticides," *Food Technology*, 8:227-29; Leo Kline, T. T. Sonoda and Helen Hanson, "Comparisons of the Quality and Stability of Whole Egg Powders Desugared by the Yeast and Enzyme Methods," *Food Technology*, 8:343-49.

[32] Cf. E. E. Lockhart and Jean M. Gaines, "Acceptance of Fresh, Frozen, Canned Orange Juice," *Food Research*, 14:429-33 (1949). Effects of another sample tasted two days previously upon the rating of a sample have been reported. H. L. Hanson, *et al.*, "Sensory Test Methods. II. Effect of Previous Tests on Consumer Response to Foods," *Food Technology*, 9:56-59, 1955.

IMPACT OF PRICE EXPECTATIONS AND UNCERTAINTIES ON DECISION MAKING BY POULTRY FIRMS

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DECISION making is the basic problem of economic life. In the operation of firms, decisions must be made without complete knowledge of the outcome and as a consequence the programming of production is frequently imperfect. Under such non-static conditions the technical relationships of production, cost of productive factors and prices received for the output are all changing through time.[1] Consequently the operator of the firm must make choices or decisions based on expected prices and expected outputs each of which include a range rather than a single valued expectation or realized value. In such situations where choices must be made without complete knowledge, the subjective evaluations of the entrepreneur are interjected into the choice-making function and may prevent the optimum allocation of resources among enterprises or firms. Choice without perfect knowledge is thus seen to be a problem of paramount importance. It presents many complexities to the entrepreneurs' problem of how to "best" play the economic game so as to combine the resources under his control to maximize his expected profits over time.

The Specific Problem of Poultrymen

The poultrymen's problem in making production plans within a dynamic and expanding economy is complicated by uncertainty regarding future prices that must be paid for factors of production and the future level of prices for poultry meats and eggs. Losses due to disease are subject to control within limits through management practices of producers. Losses due to wind, fire and the acts of God may be limited by insurance programs. However, the variations in prices paid for factors used in production and prices received for his products are due to forces external

* The authors wish to express their appreciation to James S. Plaxico of Oklahoma A & M College and Irving F. Fellows of the University of Connecticut for many helpful suggestions in preparing this article.

[1] For discussions on the firm in a dynamic setting see:

A. G. Hart, *Anticipations, Uncertainty and Dynamic Planning*, New York: Augustus M. Kelley, Inc., 1951.

J. R. Hicks, *Value and Capital*, Oxford: The Clarendon Press, pp. 191-227, 1948.

L. R. S. Shackle, *Expectations in Economics*, Cambridge: The University Press, 1949.

O. Lange, *Price Flexibility and Employment*, Bloomington: The Principia Press, pp. 20-34, 1944.

K. J. Arrow, "Alternative approaches to the theory of choice in risk-taking situations," *Econometrica* (1951), 10:404-37.

to the operation of his business and against which the producer cannot insure in the conventional manner. Of these hazards, the fluctuations in the price of the products sold are of greater magnitude and appear to be a greater hazard to producers profits.

This study was designed to gauge the impact of expectations and uncertainty on the decision making of poultry firms in Eastern Connecticut. Specific attention is devoted to broiler and egg producer price expectations; how these expectations are formulated; the degree of subjective uncertainty attached to these expectations; the effect of these expectations on production plans; aversion to income dispersion or uncertainty and the risk allowances involved; and the production responses to price certainty.[2]

Data and Research Procedure

The data upon which the conclusions of this study are based were obtained by personal interviews with broiler and egg producers in Eastern Connecticut. Both broilers and eggs are produced in commercial quantities in this area. According to the United States Census of Agriculture in 1950, this area which comprises about one-third of the total land area of the State was responsible for 74 percent of the chickens and 50 percent of the eggs produced in the State.

A stratified random probability sample was selected from a list of 354 broiler growers and 612 egg producers. Because of the high variability in the size of the production units and to insure that the samples would be spread uniformly over the whole population, a proportional sampling scheme was used to obtain a 10 percent sample of the broiler and egg producers in each stratum. The data from egg producers were obtained from August 5 to September 3, 1953 while the broiler schedules were taken between April 14 and May 7, 1954. In all observations the interview was made with the person or persons who had the responsibility of making decisions on the farm.[3]

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[2] In a note in this *Journal*, August, 1955, L. E. Drayton in a note entitled "Reactions to Uncertain Price Expectations" points out some of the weaknesses in trying to appraise producers price expectations from responses to hypothetical questions. The authors are aware of some of the limitations to this method of study but feel that it has some merit in evaluating producers' attitudes toward uncertainty. Although the authors do not attempt to qualify as phychologists skilled in depth interviewing, attempts were made in this study to probe behind superficial answers given by producers and to discover underlying reasons that may explain seemingly irrational behavior.

[3] In this connection it should be stated that while credit is widely used in both broiler and egg production in Connecticut, the farmers in a great majority of the cases retains full ownership of he birds, make all decisions concerning production and marketing and take full responsibility for profit or loss. Broilers grown under terms where the birds belong to a feed dealer or hatcheryman, and the farmer receives a wage for caring for birds, probably amounts to less than 20 percent of the birds grown in Connecticut.

Price Expectations and Reaction to Uncertainty by Poultry Firms

The poultry producer who seeks to maximize his profits over time must plan a stream of expenditures for factors of production and a stream of receipts from product sales. In this respect he is forced to form estimates or expectations of the prices he must pay and of those he may obtain for his outputs. The producer can seldom be sure of his expectations, i.e. his expectations are seldom single valued. Instead, the producers may think of a probable range of prices and attach a certain probability to the occurrence of any one price. Since knowledge about future prices is imperfect, logic would suggest that producers would discount their price expectations to obtain a guaranteed minimum price. On this matter Hicks and Lange state that the most probable price expected by the entrepreneur will be discounted to an "equivalent price expected with certainty."[4]

One reason why poultry producers may prefer relatively certain situations is because of limited capital resources. The firm is handicapped in situations of uncertainty because with limited resources one cannot be sure that luck will "balance out" since an initial loss may severely handicap or destroy the opportunity to engage in further activities. Hence the poultryman may tend toward conservative practices and restrict the amount of capital ventured.

Producers were asked a series of questions to determine the nature of the price expectations held and their affinity or disaffinity for assuming risk.

Egg Producers: Of 62 egg producers studied only 32 stated both the most probable price expected and the minimum guaranteed price that they would accept for the coming production period. Fourteen producers (44 percent) asked a higher guaranteed price than the most probable they expected to prevail; 34 percent would accept a guaranteed price at the same level they thought most probable; and only 22 percent would accept a guaranteed price lower than the price they thought most probable.

Next the sample was restricted to those producers who expressed an opinion on these three points: (1) the most probable price expected, (2) the range of possible prices that might occur, and (3) the minimum guaranteed price that they would accept. Only 14 egg producers gave answers to these three questions. Within this group it was quite apparent that the guaranteed price was skewed toward the top of the range that producers thought possible. For 13 producers (93 percent) the minimum guaranteed price that they would accept was equal to or greater than

[4] J. R. Hicks, *Value and Capital*, p. 126, and O. Lange, *Price Flexibility and Employment*, pp. 30-32.

their most probable price expectation. Only one producer was willing to discount his price expectations for the certainty of a guaranteed price, while for 5 producers (36 percent) the minimum guaranteed price that was acceptable was above the top of the range of prices that they thought might occur. These findings are contrary to what theory leads us to expect, but agree with those of several other studies of farmers price expectations made in recent years.[5]

These findings suggest that egg producers would not sign a contract for a guaranteed price unless there was a high degree of certainty that this price would be above the market price. Further inquiry and exploration revealed that poultrymen generally feel that buyers have more accurate price information than they, especially about future prices. To counterbalance the advantage that the buyer is assumed to have, the strategy of the producer appears to be to test the expectation pattern of the buyer without revealing his own true expectation. Thus, the producers initially ask a price higher than their true expectation would warrant. This prevents the producers from committing themselves to a price lower than the buyer is willing to pay and enables them to glean new market information from the buyers responses. Furthermore, many producers feel that they would be offered a contract only if the dealer had a high degree of certainty that it would be to his advantage (and to the producers disadvantage) to do so. Thus the refusal to discount their price expectations for a guaranteed price should not be interpreted as proof that poultrymen have a high affinity for risk. Instead such actions appear to be a part of producers' strategy in bargaining with buyers.

Broiler Growers: The broiler growers reactions to guaranteed prices were similar to those expressed by the egg producers. Only 15 of 36 producers expressed an opinion on both the most likely price and the guaranteed price at which they would be willing to sell twelve weeks ahead. Eleven producers (73 percent) demanded a higher guaranteed price twelve weeks in advance than they thought was most likely to prevail when the birds were ready to market. A simple average of the prices that producers considered most likely at the end of twelve weeks was 26.8 cents per pound while the guaranteed prices demanded by producers averaged 28.4 cents per pound.

In an effort to further assess the attitude toward risk in broiler prices

[5] D. B. Williams, "Price Expectations and Reactions to Uncertainty by Farmers in Illinois," *Journal of Farm Economics*, Vol. XXXIII, No. 1, 1951, pp. 20-39.
of Uncertainty in Farm Planning," *Journal of Farm Economics*. Vol. XXXI, No. 2,
O. H. Brownlee, and Walter Gainer, "Farmers Price Anticipations and the Role of Uncertainty in Farm Planning," *Journal of Farm Economics*. Vol. XXXI, No. 2, 1949, pp. 266-275.
J. A. Boan, "A Study of Farmers Reactions of Uncertain Price Expectations," *Journal of Farm Economics*, Vol. XXXVII, No. 1, 1955, pp. 90-95.

the following proposition was presented: "Suppose when each of your next three batches of birds is ready to market a dealer offers you a price that would give you a net return of ten cents per broiler. Would you prefer this situation to one in which for each batch you had a 50-50 chance (such as a flip of a coin) of making either 20 cents or zero cents per bird?"

The producers were then offered a series of propositions each offering a sure profit of 10 cents per broiler or a fifty-fifty chance of obtaining either of two extreme profit positions. The propositions offered the producers were as follows:

Proposition

(a) Sure of 10 cents or a fifty-fifty chance for 0 or 20 cents per bird.
(b) Sure of 10 cents or a fifty-fifty chance for 0 or 25 cents per bird.
(c) Sure of 10 cents or a fifty-fifty chance for 0 or 30 cents per bird.
(d) Sure of 10 cents or a fifty-fifty chance for 0 or 18 cents per bird.
(e) Sure of 10 cents or a fifty-fifty chance for 0 or 15 cents per bird.
(f) Sure of 10 cents or a fifty-fifty chance for 5 or 15 cents per bird.
(g) Sure of 10 cents or a fifty-fifty chance for 5 or 20 cents per bird.

The propositions were presented to the producers in the order listed above, but all propositions were not presented to all producers. Instead the questioning was asked in a manner aimed at detecting the *point* at which the producer would be willing to accept the risk situation. For example, if the producer accepted the risk situation in (a) it was not necessary to present propositions (b) and (c). Instead the questioning dropped immediately from (a) to (d). Likewise, if the respondent refused the risk situation in (d) it was not necessary to offer (e) which had an even lower expected value. Situation (f), like (a), was presented to all respondents. Only those who refused situation (f) were offered (g).

The expected profit from each of the risk situations is the sum of each extreme value multiplied by its probability. Thus the expected profit from situations (a) and (f) is 10 cents per bird, the same as the sure value. The expected profits from situation (b), (c), and (g) are 12.5, 15.0, and 12.5 cents per bird, respectively, while risk situations (d) and (e) offer expected profits of 9.0 and 7.5 cents per bird respectively.

When the risk situations were arrayed according to expected values it was found that 15 producers accepted the poorest risk situation (0 or 15 cents per bird) although the expected return was 2.5 cents per bird less than the sure value. On the other extreme, 5 producers refused to accept any of the risk situations, choosing instead to receive a sure profit of 10 cents per bird (Table 1).

To further test the producers' reactions, two situations involving a minimum profit of 5 cents per bird were offered to insure that fate would

not be too unkind. Under these circumstances, a slightly higher proportion of the growers accepted the reduced risk situations. For example 22 producers elected to take a chance on the 5 or 15 cent situation while only 20 elected to take a chance on the 0 or 20 cent per bird situation even though the expected value from both situations was the same (10 cents). It should be noted that both of the risk situations having a 5 cent per bird minimum offered the producer an expected value of 10 cents or more per bird. To test the producers reaction to the reduced risk more completely, situations offering expected profits of less than 10 cents per bird probably should have been made.

TABLE 1. NUMBER OF BROILER PRODUCERS WHO CHOOSE THE SPECIFIED RISK SITUATIONS INSTEAD OF A SURE PROFIT OF 10 CENTS PER BIRD, CONNECTICUT, 1954[1]

Possible profit from risk situations	Added number accepting risk	Cumulative number	
		accepting risk	accepting surety
(cents per bird)	(number)	(number)	(number)
	I. Situations offering zero minimum profit		
0 to 15	15	15	19
0 or 18	5	20	14
0 or 20	0	20	14
0 or 25	5	25	9
0 or 30	4	29	5
	II. Situations offering 5 cents minimum profit		
5 or 15	22	22	12
5 or 20	4	26	8

[1] Thirty-four producers participated in this question while two refused to answer these propositions.

The choices made by producers suggest that the majority of the producers prefer to take a risk on price fluctuations than accept price certainty at the levels offered. For example, fifty-nine percent of the growers indicated that they were willing to accept a *negative* risk premium of 1 cent per bird by choosing to take a chance on 0 or 18 cents per bird instead of the sure profit of 10 cents per bird.[6]

[6] These propositions are in some respects similar to the "sure chance questions" that Williams offered the Illinois farmers. However, in each of the propositions offered by Williams the expected value of the risk situation was just equal to the "sure" value. Thus the farmer would be equally well off by accepting either the risk or sure value, assuming that the situation would arise a large number of times. In each of the situations offered by Williams the majority of the farmers selected the sure value instead of the risk. These findings are contrary to those of this study and seem to be contrary to the position taken by the Illinois farmers on price expectations since they refused to discount their most probable price expectations for a guaranteed price.

D. B. Williams, "Price Expectations and Reactions to Uncertainty by Farmers in Illinois," *op. cit.*, pp. 30-31.

The willingness of growers to accept such risk situations probably reflects the attitudes of local growers toward dealers or handlers of poultry rather than their attitude toward risk. Many growers probably reasoned that if the buyer was willing to offer a sure profit of 10 cents per bird that the market price would probably be even higher.

The authors assumed that to be consistent the broilermen who asked a guaranteed price above their most probable expectation would be likely to accept risk situations that offered expected values lower than the sure value. Analysis revealed that of the 11 broilermen who asked guaranteed prices above their most probable expectations, 8 accepted risk situations offering lower expected returns than the sure value of 10 cents ber bird.

The growers were then divided into two groups, one consisting of those who had indicated a strong preference for risk by accepting the risk situations (d) and (e) when the assured price of 10 cents per bird was greater than the price expected from the risk situations and the other comprised of the conservative producers who chose surety or selected risk situations only when these offered opportunities for greater returns.

Analysis was made to try to determine what factors influenced the producers decisions in regard to risk. It was thought that such factors as the age of the operator, size of the enterprise or liquidity position of the producer might be related to his choice of the risk or surety situation. However, the statistical tests employed suggested no significant difference between the groups with respect to any of these factors.

Responses to Price Certainty

What impact does price uncertainty and the flexibility required to make production adjustments to expanding knowledge have on production plans? To gain information on this proposition egg and broiler producers were asked to give their production plans under assumed conditions of price certainty.

Producers' responses indicated that if price for the coming season were known with certainty far enough in advance to make adjustments in housing space (ceteris paribus) the number of layers and broilers grown would increase rapidly with higher prices. Linear regression analysis of the association between the number of layers housed under conditions of certainty and postulated prices from 30 to 80 cents per dozen resulted in a correlation coefficient (r) of 0.96 and a price elasticity of supply of 1.83 for all flock size groups. Measurement of the degree of association between the number of broilers that would have been grown under conditions of price certainty and postulated prices of 18 to 36 cents per pound gave a correlation coefficient (r) of 0.94 and a price elasticity of supply of 3.86 for all size groups. Broiler producers having

capacities of 25,000 or more birds appear to have a much lower price elasticity of supply than those having smaller capacities. Also the elasticity of supply was significantly lower for egg producers than among broiler growers. Tables 2 and 3 give the coefficients of correlation and

TABLE 2. CORRELATION RESULTS OF RELATING THE NUMBER OF LAYERS PRODUCERS WOULD HAVE HOUSED IN 1953 TO POSTULATED PRICES KNOWN WITH CERTAINTY AS OF FEBRUARY 1, 1953

Flock size	Correlation coefficient (r)	Price elasticity of supply
0– 249	0.96	1.09
250– 499	0.96	2.15
500– 999	0.98	2.16
1,000–1,499	0.98	1.66
1,500–1,999	0.94*	0.23
2,000–2,499	0.91	2.67
2,500–4,999	0.98	1.35
5,000–over	0.90	1.83
Entire sample	0.96	1.83

* The coefficients for flock sizes of 1,500 to 1,999 were not significant. All other coefficients significant at the 5 percent probability level or better.

elasticities of supply for each of the flock size classifications for eggs and broilers respectively. Responses obtained in this manner are subject to the limitation of all questions of a hypothetical nature—would the producer's actions correspond to his responses to such propositions. At best the estimated parameters provide only an approximation of the responses

TABLE 3. CORRELATION BETWEEN THE NUMBER OF BROILERS THAT WOULD HAVE BEEN GROWN IN 1954 IF POSTULATED PRICES FOR 1954 HAD BEEN KNOWN WITH CERTAINTY JULY 1, 1953

Broiler capacity	Correlation coefficient	Price elasticity of supply
0– 4,999	0.92	+3.32
5,000– 9,999	0.92	+4.09
10,000–14,999	0.97	+2.63
15,000–19,999	0.98	+2.07
20,000–24,999	0.90*	+3.34
25,000–over	0.81*	+0.18
All groups	0.94	+3.86

* The coefficients for the two groups having 20,000 or more capacity were not significant. All other coefficients were significant at the 5 percent probability level or better.

that might occur in the real world. However, information of this nature may provide insights into the production effects of governmental price programs such as forward prices or direct payments to producers where prices are known for the production period ahead.

Responses to Depressed Prices (Uncertainty Present)

Because of the uncertainty surrounding future prices, poultrymen generally do not alter production plans because of short-run price fluctuations. Egg producers tend to continue production once the birds are housed so long as the returns cover feed cost or until the end of the production period. If prices should drop below the variable cost of production, the poultryman may cull heavier or sell the flock depending upon his price expectations for the period ahead.

Furthermore, broiler growers do not ordinarily cut-back production after selling a batch at cost or for less than cost. Producers' responses in this study indicated that there would be no significant reduction in production after selling one batch at prices that just returned the cost of chicks, feed, and litter. Two successive batches sold at cash cost of production would cause an aggregate 4 percent reduction, and three successive batches would result in a total cut-back of about 17 percent in the number of broilers produced. This reduction would result largely from producers being forced out of production rather than from voluntary reductions in the volume grown by those who continue production. Although the magnitude of the adjustments to such a hypothetical situation may be questioned, the response indicates a determination in the producer's mind to maintain a stable level of output.

The results of this survey suggest that producers' response to depressed prices would be to continue production at full capacity until they are forced out. The uncertainty surrounding future price expectations is the primary factor underlying the producers reluctance to cut-back production. Since broiler price fluctuations occur without any discernible seasonal pattern and no formula has been devised to accurately predict future prices,[7] there appears to be no benefit to the producer in trying to time production to coincide with the peaks in prices. Some producers hold the expectation model that depressed prices will force others (usually those in weak financial position or poor managers) out of production thus causing the future price to be more favorable. The result is that producers tends to keep their houses filled and accept the price fluctuations as a part of the business.

The data indicate that the greatest adjustment to depressed prices would be made by the smaller producers. For example, three successive batches sold at a price that only covered feed, chicks and litter would cause a 59 percent reduction among broilermen with less than 5,000 birds but no reduction was indicated for producers housing more than 20,000 bird capacity. This finding coincides with the more inelastic

[7] G. G. Judge, and I. F. Fellows, *Economic Interpretations of Broiler Production Problems,* Storrs Agricultural Experiment Station Bulletin 302 (1953), p. 17.

broiler supply function for capacities of more than 25,000 birds (see Table 3).

Methods of Combating Price Uncertainty

Price fluctuations are responsible for sharp year to year changes in the net income of egg and broiler producers. By what means (if any) do poultrymen protect themselves from the uncertainty of prices from year to year?

The means commonly used by poultrymen to protect themselves from the uncertainties of price fluctuations were off-the-farm employment and other farm enterprises. Working off-the-farm and diversification of farm enterprises were generally restricted to producers who had relatively small poultry enterprises. The breaking point between a full-time and part-time enterprise appeared to be about 1,500 layers from egg producers and 12,000 to 15,000 bird capacity for broilermen. Approximately two-thirds of the producers who kept less than 1,500 laying birds or had less than 15,000 bird capacity for broilers either worked off-the-farm or had other farm enterprises to supplement income. Furthermore, by limiting the sample to those who presumably spent full-time caring for the laying flock, the average age for producers who kept less than 1,500 birds was 71 years while the average age for those who kept larger flocks was 51 years. No relationship was found between capacity and age of the operator on broiler farms.

Another means by which broilermen reduce the impact of price fluctuations upon income is by marketing broilers in smaller lots but at more frequent intervals. This is accomplished by starting smaller lots of chicks at frequent intervals. Since birds are marketed more often there is less chance of selling a large number of birds on a low market and the price fluctuations "average out" sooner. Seventeen percent of the broilermen surveyed used this method to reduce the risk of broiler price fluctuations.

For the most part, however, producers who have full time egg or broiler enterprises attempt to meet the emergencies created by price fluctuations by building up equity in the business in periods of prosperity or establishing a good credit rating to withstand temporary losses.

Impact of Price Uncertainty on the Choice of Enterprises—Eggs vs. Broilers

Producers often have a choice of producing either eggs or poultry meat with the resources available on poultry farms. Although the equipment needed is not identical, the buildings generally can be adapted to either egg or broiler production with minor changes. During periods of depressed prices a small proportion of producers change from broilers

to egg production (or, vice versa) and the enterprises are frequently combined on farms in order to reduce risk or to better utilize brooding space during seasons when this is not needed for growing replacements for the laying flocks. Since the broiler and egg industries exist side by side in the same area and the resources used are to some extent interchangeable, what factors determine the producers choice of whether to produce eggs or broilers?

Logic would suggest that if the value of the marginal product is greater in one industry than in another, resources will tend to move to the industry where the marginal return is greater. Using this criterion, it appears that the value of the marginal product from resources used in broiler production must have been greater than from egg production in recent years, since the broiler industry has grown far more rapidly.

However, short-run price fluctuations appear to be a greater hazard in broiler than in egg production. Since egg producers sell eggs each week, the short run fluctuations in price are quickly evened out. Furthermore, egg prices have well established seasonal price patterns and producers can adjust production to take advantage of seasonally high prices. On the other hand, broiler prices are subject to rather violent price fluctuations that occur without any well defined seasonal pattern. Although such fluctuations will doubtless "average out" over time, it is possible that a producer with limited resources might be "wiped out" by a streak of bad luck—i.e., by being forced to sell two or more batches at times when prices were temporarily depressed. Therefore, the amount of importance attached to this hazard is an important factor in determining whether the individual poultryman produces eggs or broilers.

Poultrymen who preferred broiler growing over egg production did so because there was less work involved (which gave more opportunity for leisure or work off-the-farm) and more opportunity for profit from broilers. The reason given most commonly by egg producers for preferring this enterprise over broiler production was that there was less risk due to price fluctuations in egg production. This would suggest that many egg producers might be more conservative than their neighbors who raised broilers—i.e., they were willing to discount the possibility of higher profits from broilers for the relative security offered by egg production.

Summary

Both egg and broiler producers refused to discount their most probable price expectations in favor of a guaranteed price. Instead, the minimum price quarantee that was acceptable to most poultrymen was higher than their most probable price expectation. Furthermore, many broilermen indicated a willingness to accept risk over surety even in situations where

the expected return from the risk was less than the sure value.

Further exploration offered a logical reason why poultrymen refused to discount uncertain price expectations. Many poultrymen believe that buyers generally have superior knowledge about future prices and, further, that they would be offered a guaranteed price—only if the buyer had a high degree of certainty that it would be to his advantage to do so. Instead of discounting their price expectations, the producers frequently ask prices higher than their own expectation would warrant in order to feel out the expectation pattern of the buyers. This seemed to indicate an attempt to counter-balance the advantage of more perfect knowledge of future prices that the buyer is assumed to have rather than an affinity for risk. In fact, the primary reason why egg producers selected this enterprise instead of broiler production was because of a disaffinity for risk.

PROBLEMS OF FACTOR-PRODUCT AGGREGATION IN COBB-DOUGLAS VALUE PRODUCTIVITY ANALYSIS

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CONSIDERABLE effort has been and is being directed to the fitting of whole-farm production functions of the Cobb-Douglas (linear in logarithms) variety to farm account and farm survey data. Recently Drake, Johnson and others[1] have shown that it is possible to present marginal productivity estimates in a manner meaningful to farmers and others with little formal training in economics. As attention is given to the development of estimating equations most useful to farmers and to professional workers in agriculture, it seems desirable to reconsider some of the basic difficulties inherent in the fitting and interpretation of whole farm functions of the Cobb-Douglas type. It is the purpose of this paper (1) to show how the aggregation of products into a dependent variable and the aggregation of inputs into different independent variables may affect the value and the reliability of the estimated parameters, (2) to indicate the conditions associated with an optimum aggregation, and (3) to question the usefulness of Cobb-Douglas estimates as guides for intra-farm and policy decisions.

The Function

The Cobb-Douglas function postulates complementarity among inputs and allows diminishing marginal productivity to each input factor as well as increasing or decreasing returns to scale. The function is not capable of reflecting successive areas of increasing, decreasing, and negative returns, as elasticity of production is assumed to be constant over the entire range of inputs. Cobb-Douglas functions are easy to fit because the coefficients of the ordinary least squares equation are the elasticities of production of the respective input variables.[2]

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[1] Louis S. Drake, "A Method of Showing Farmers How to Estimate Gross Income and Marginal Value Products," *Journal of Farm Economics*, Vol. 36, Number 1, Feb. 1954, pp. 66-77.

Glenn L. Johnson, "Sources of Incomes on Upland Marshall County Farms" Progress Report 1, Kentucky Agric. Exp. Sta.—Also other reports in the same series.

[2] Gerhard Tintner, "A Note on the Derivation of Production Functions From Farm Records," *Econometrica*, Vol. 12, No. 1, January 1944, pp. 26-34.

Gerhard Tintner, and O. H. Brownlee, "Production Functions Derived From Farm Account Record," *Journal of Farm Economics*, Vol. 26, Aug. 1944, pp. 566-571.

Earl O. Heady, "Production Functions from a Random Sample of Farms," *Journal of Farm Economics*, Vol. 28 (Nov. 1948), pp. 989-1004.

There are several alternative functions which can be fitted by the least squares process. For example, a second or third degree polynominal would reflect diminishing returns and allow different elasticities of production at different levels of input. However, the fitting of a second degree polynominal with an interaction term would require the fitting of more than twice as many constants as the Cobb-Douglas equation. Thus, computations would be increased while degrees of freedom would be sacrificed.

The Cobb-Douglas type function is usually selected as the appropriate functional form because it specifies diminishing productivity and diminishing marginal rates of substitution among factors and is relatively easy to fit. Aggregation and interpretation problems involved in fitting the Cobb-Douglas function are difficult. However, use of alternative functions or alternative procedures fails to avoid these difficulties.

Optimum Aggregation

At any point in time a given farm firm employs a unique number of inputs combined in some fashion. In order to reduce the number of input variables to a manageable size it usually becomes necessary to aggregate the different inputs into a finite number of categories. The manner in which these inputs are aggregated may influence the estimated parameters which are the basis of the total and marginal income (productivity) estimates. For example, the following may represent a possible aggregation where X represents the aggregated input categories and I represents the various individual input factors:

$$X_1 = I_1$$
$$X_2 = I_2 + I_3$$
$$X_3 = I_4$$

Another possibility may be:

$$X'_1 = I_1$$
$$X' = I_2$$
$$X'_3 = I_3 + I_4$$

It is apparent that if the Cobb-Douglas function is fitted to the same data, aggregated in these two alternative fashions (1) goodness of fit of the functions will likely differ, and (2) the estimated parameters, including marginal productivity values, will be different. These differences apply to the parameters and marginal value products of the X_1 and X'_1 categories although these categories consist of a single, therefore homogeneous, input which is the same in the two suggested aggregations.

This set of circumstances arises from the different implicit assumptions relative to inputs I_2, I_3, and I_4. In each case it is postulated that an

increase in the input of I_2, I_3, or I_4, will increase output (assuming elasticities of production > 0). However, the first set of aggregates indicates that I_2 and I_3 are perfect substitutes and affect output in an additive manner. On the other hand, the second set of aggregates indicates a nonlinear substitution relationship between these two factors and a nonadditive relationship between these two inputs with respect to output.

Any set of inputs that must be used in fixed proportions (perfect complements) should be treated as one input; otherwise the estimated parameters will be biased. In similar manner if two inputs have precisely the same effect on production they must be weighted and combined. The latter condition implies a constant marginal (linear) rate of factor sub-

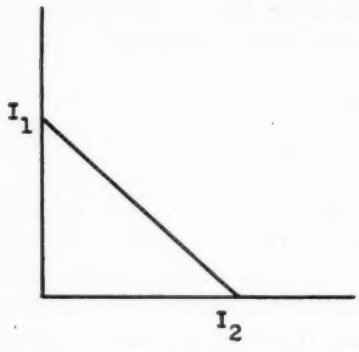

FIG. 1

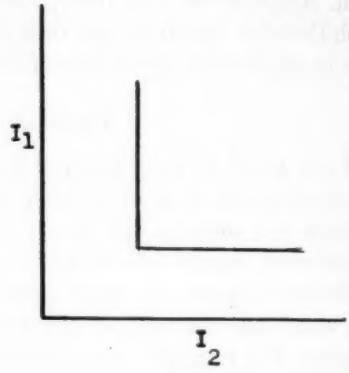

FIG. 2

stitution where the inverse of the respective price ratios equals the marginal rates of substitution. It follows that failure to aggregate perfect complements and perfect substitutes will bias estimates just as will the aggregation of two inputs which are imperfect substitutes or complements. This is the case because the model specifies diminishing marginal rates of input substitution and assumes that the level of each input affects the productivity of others.

Figures 1-3 show the three ways that two inputs may substitute for each other in the production of a given product. Figure 1 implies a constant rate of substitution between I_1 and I_2. It would be proper to aggregate these two inputs into a single category (1) if the inverse of the price ratios equals the marginal rate of substitution,[3] and (2) if the two inputs substitute one for the other at the same rate in the production of each relevant product. Figure 2 indicates that I_1 and I_2 are perfect complements and should therefore be aggregated if this same relationship exists

[3] Although the relevant price ratio does not equal the rate of substitution the two inputs may properly be combined if all farms use the two inputs in the same proportion. The resulting estimate will accurately portray actual productivity but the potential under optimum combination will be underestimated.

in the production of all products and if each observed firm combines I_1 and I_2 in the one optimum fashion.

In Figure 3, I_1 and I_2 substitute for each other at a diminishing marginal rate. This is, of course, the more usual farm input relationship and is therefore particularly relevant to the problem in question. Under this assumption I_1 and I_2 should be combined if (1) each of the observed farms uses I_1 and I_2 in the combination indicated by point b on the factor-factor substitution functions (i.e. at the point where the marginal rate of factor substitution equals the inverse of the price ratios),[4] and

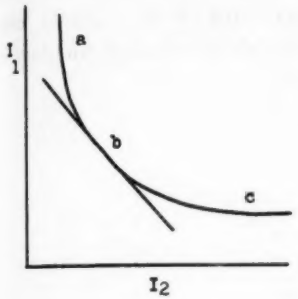

FIG. 3

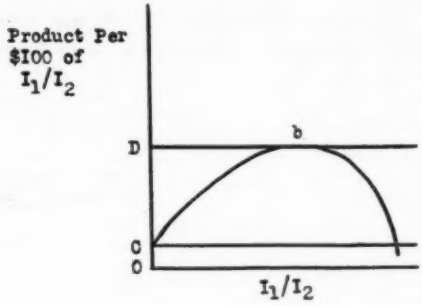

FIG. 4

(2) the factors, substitute one for the other at the same rate in the production of each relevant product.

Assuming no errors of observation, an optimum product combination, and that the model is appropriate, the degree of accuracy (statistical significance) of the computed elasticities and marginal products depends on the extent to which the observed intra-aggregate factor allocation varies from firm to firm. For example, in Figure 3 consider the intra-aggregate factor combination of firms a, b, and c. Firm a is using an excess of I_1 relative to I_2, b is using an optimum combination, and c is using an excess of I_2 relative to I_1. As the ratio of I_1 to I_2 varies, the output in dollars per dollar unit of input changes as indicated in Figure 4. For example, firm a, other things equal, would receive only OC output per $100 input of the aggregate compared with an output of OD for firm b.

Similar general statements may be made relative to the aggregation of outputs. Single aggregates stated in money terms, such as gross income or net income, have been used to describe output variables. Thus, prices are applied to outputs (products) such as corn, wheat, oats, pork, milk,

[4] Obviously this is a rather unlikely assumption. One would scarcely expect entrepreneurs to combine inputs within a category in an optimum fashion while categories of resources are misallocated. Nevertheless whole farm function analysis is relevant only if the inter-aggregate misallocation is significantly greater than the intra-aggregate misallocation.

etc., and the sums added to reduce these products to a single output figure.

The aggregation of all products into a single output category may be accomplished without bias when the set of products are produced in fixed proportions. Also, sets of outputs may properly be combined if they are affected in the same manner by each input category. This implies constant rates of product substitution with reference to all inputs and all products with price ratios properly equated. It is doubtful that this set of circumstances occurs frequently in the real world. Thus, it would appear that aggregation of outputs into a single category may well introduce a highly significant bias into estimates. For example, consider the case of two outputs (enterprises) which are complementary in

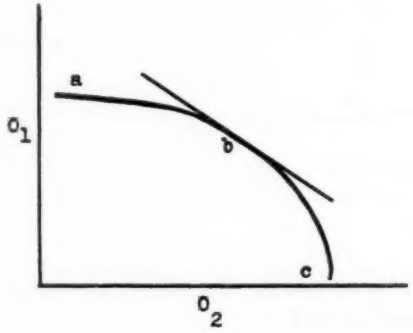

FIG. 5

the use of some resource. In this case, allocating additional inputs to O_1 will also increase the output of O_2. Thus the combination in which O_1 and O_2 are produced will affect the marginal productivity of resources. A similar relationship is true in the case of a supplemental relationship between outputs.

The absence of complementary and/or supplementary product relationships is not a sufficient condition to justify aggregation of outputs. Profits of a firm are maximized when the marginal returns of all inputs in the production of all products are equated. Therefore, resource misallocation, as reflected by a low marginal productivity of one or more input aggregates, may well be due to the production of an inferior set of products. This is because there is a specific marginal product for each input variable with respect to each output variable with any given input combination. Thus, if estimates indicate a low marginal productivity of some input variable there are at least three possible explanations. These are: (1) the inputs are combined in a non-optimum manner, (2) inferior production techniques are used, (3) an inferior set or combination of products is produced. Thus, it would appear that the aggregation of all

products into a single category may well bias estimates to such an extent as to virtually destroy the usefulness of derived estimates.

Typically, products substitute one for the other at a diminishing marginal rate as indicated in Figure 5. If observed firms produce such a product combination as to equate marginal rates of substitution with the

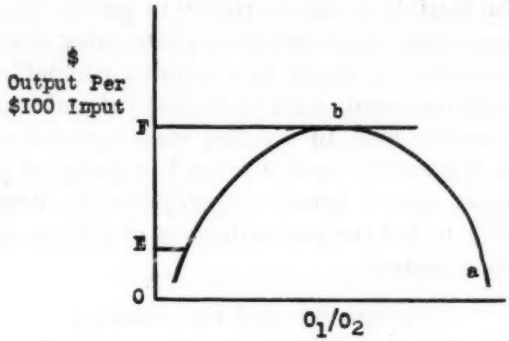

FIG. 6

inverse of the price ratios and each product is affected in the same manner by each input, the products may properly be aggregated. Also, as is true in the case of input combination, the degree of variation in the product combination determines the variability of marginal returns to a given input, other things remaining the same. As Figure 6 indicates, the

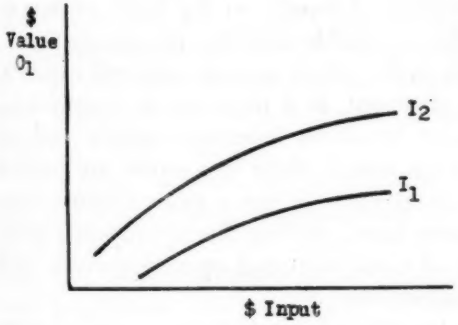

FIG. 7

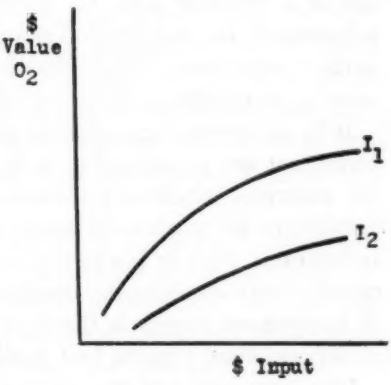

FIG. 8

combination in which O_1 and O_2 are produced by firms c and b may cause a variation in marginal output per $100 input of EF amount with the given price relationship.

An interrelated aggregation difficulty is that the different inputs may have a different effect on the different products. Such a relationship is shown in Figures 7 and 8. In this example both I_1 and I_2 may increase the

output of O_1 and O_2. However, the returns to I_1 are greater in the production of O_2 while the returns to I_2 are greater in the production of O_1. Thus, if O_1 is aggregated with O_2 or I_1 with I_2 the derived estimates will be seriously biased.

"Practical" Considerations

It may not be feasible to adhere rigidly to guides that would produce essentially homogeneous input and output categories. Since it is necessary to reduce the number of inputs to a number compatible with clerical resources, perhaps one needs a set of guides that makes estimation practical with a minimum bias. In isolating such aggregates the researcher must to a large degree rely upon *a priori* knowledge of production relationships. However, once a tentative aggregation has been decided upon it is often possible to test the reasonableness of a given aggregate on the basis of correlation analysis.

Investments and Expenditures

Inputs may be broadly classified as investments and expenditures. The productive value of investments spans two or more accounting periods, while the productive value of expenditures is expended within the accounting period. Investments and expenditures may or may not be reasonably good complements or substitutes. For example, electric motors (investment) and electricity(expenditures) are complements. However, perhaps a more efficient motor may be substituted, but likely not at a constant rate, for electricity. Custom hired machinery may be substituted for machinery purchases, although it is not necessarily a perfect substitute. Thus, classification of inputs on the basis of investment or expenditure does not offer a suitable criterion of aggregation.

It is, of course, necessary to properly weight investments and expenditures that are combined as a single input. It is improper to simply add, for example, machinery investment based on inventory values, and expenditures for machinery hired, even though these two inputs are perfect substitutes. This is because a capital value is not a price (input) comparable with expense for machinery hired. Rather, the appropriate price of investment inputs is the total of ownership and operating costs such as depreciation, repairs, fuel, insurance, etc.

One may argue that reducing investment inputs to an annual service cost basis is unsatisfactory due to the difficulty of estimating yearly investment inputs. However, since it is generally recognized that different pieces of machinery and different classes of livestock depreciate at different rates, it is certainly improper to consider investment in machinery or livestock investment as homogeneous input categories. Such would be the case only, for example, if the annual input (cost) of a $2,000 tractor

is 10 times as great as a $200 milking machine. Thus, it is likely that placing investment inputs on an annual or service basis may contribute more to homogeneity of inputs than judgment errors in making such adjustments would cost.

Input aggregation based on effect on the output variable may in part serve to test the pattern of production. For example, if marginal returns to the livestock inputs are high relative to other inputs, one may infer that livestock output could be profitably expanded. However, further information would be required to determine which livestock enterprise should be expanded. Also in the case of mixed inputs, that is, inputs contributing to more than one output, one would not know which output could be most profitably expanded.

The fitting of a separate function to the different types of farms is another method of testing the effect of the composition of the output variable on the productivity of individual inputs. If, for example, typical inputs on two different type farms are the same and all elasticities are greater for one type farm, one would infer that the product choice is superior to that of the other type farms. However, since different type farms would be expected to "require" different combinations of resources, a more likely result would be higher returns to one input on one type farm and lower on others.

The fact that different type farms use different combinations of inputs is ample reason for separating farms by type and fitting separate functions. Farms in a cow-calf beef type of business, for example, are considered to be heavy users of capital while labor requirements are low. On the other hand dairy farms are generally considered to be "labor using" and "capital saving." Thus, it would appear that fitting a single function to a mixture of these farming types would result in rather gross average estimates of marginal productivity of the different inputs in any given combination. Such estimates would be of little value as guides to intra-farm decisions.

Heady has to some degree avoided difficulties inherent in aggregating oututs by fitting separate functions for livestock and crops.[5] This procedure is satisfactory if the level of output of livestock does not significantly affect the productivity of the different resources involved in crop production and vice versa. In addition, the raw data must be in such form that it is possible to allocate inputs used by crops and livestock in proper proportions. In the case of such items as labor this would require rather detailed data. If sufficient data were available relative to the different resources in the production of the different outputs, it would

[5] Earl O. Heady, *Productivity and Income of Labor and Capital on Marshall Silt Loam Farms in Relation to Conservation Farming.* Iowa Research Bulletin 401, October 1953.

be possible to fit a separate function for each output variable. Then if substantial independence of outputs can be assumed, given quantities of different resources could be allocated in an optimum manner.

A regression function that is capable of considering two or more output variables is, of course, possible to fit.[6] Such a function may take the following form:

$$Y_1^{a_1}Y_2^{a_2}\cdots Y_n^{a_n}=b_0X_1^{b_1}X_2^{b_2}\cdots X_n^{b_n}$$

This function would make it possible to estimate the marginal productivity of a given input with respect to a given output (product) with other inputs and outputs at various levels. However, the fitting of functions where more than one output is considered is somewhat involved and this particular form leaves much to be desired from the standpoint of economic logic.

Problems of Interpretation
Inter-Farm vs. Intra-Farm

The Cobb-Douglas function applied to observations of different firms during a particular point or period of time describes inter-farm production relationships.[7] Nevertheless, if the different firms are on essentially the same function, such inter-firm relationships could be useful in individual farm planning. In general, if the different firms use essentially similar techniques of production and produce essentially the same combination of products, it is not unreasonable to expect the production function of individual firms to closely resemble the derived inter-farm function.

Perhaps much of the heterogeneity of functions can be eliminated by careful selection of sample farms, systematic aggregation, and judicious use of derived data to see that it is applied to similar farms. However, despite these precautions, estimates may be subject to sizeable bias due to: (1) certain inputs are not included; (2) managers likely seek to maximize returns over a time period other than the period considered; (3) farmers use a mixture of old and new techniques; (4) managers plan on the basis of expected prices and technical relationships but the analysis is based on realized ratios.

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[6] Irving Lorge, "The Computation of the Hotelling Canonical Correlation," *Proceedings of Educational Research Forum*, Endicott, N.Y., Aug. 26-31, 1940, pp. 68-74.

F. V. Waugh, "Regression Between Sets of Variates," *Econometrica*, 10 (1942), pp. 290-310.

[7] M. Bronfenrenner, "Production Functions: Cobb-Douglas, Interfirm, Intra-firm," *Econometrica*, Vol. 12, Jan. 1944, pp. 35-44.

M. W. Reder, "An Alternative Interpretation of the Cobb-Douglas Function," *Econometrica*, Vol. 11, July-October 1943, pp. 259-264.

Observation would suggest that the quality and the quantity of management varies widely from farm to farm. However, there is as yet no satisfactory objective measure of the managerial input. Thus, when functions are fitted it is "assumed" that managerial inputs are randomly distributed. That is, it is assumed that management on large and small farms, or on farms using much and little of the livestock input, is on the average the same. Thus, the omission from the estimating equation of relevant variables, such as management, risk preference, etc., may seriously bias estimates.

Farm managers likely seek to maximize returns over some period greater than one year. Thus, the observed combination of resources at any given time may represent an attempt to maximize returns over some period greater than the time (usually one year) observed. This is most

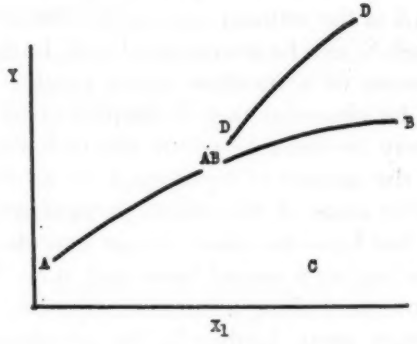

FIG. 9

likely to occur in the case of longer term investment items which typically must be added in lumps. An example of such a possibility is the case of the purchase of additional land. Often several years are required to reorganize the business or to recombine inputs in an optimum manner.[8]

In Figure 9, output is depicted by Y while X_1 represents an input category. Input X_1 may be freely varied over a given range. That is, it is not necessary to add X_1 in large (discrete) lumps. However, it is assumed that there is a necessary lag in the response of Y as X_1 is increased. Line AA shows the expected relationship between X_1 and output within the rational range of input of X_1 when some other input (X_2), which must be added in lumps, is at a given level. In like manner BB is the rational range of the production function of X_1 with respect to Y when X_2 is at some higher level. Lines AA and BB are drawn so that adding X_2 does

[8] For a cogent discussion of cost function shifts during periods of adjustment see W. W. Cooper, and A. Charnes, "Silhouette Functions of Short Run Cost Behavior," *Quarterly Journal of Economics*, Vol. LXVIII, February, 1954, pp. 131.

not change the nature of the relationship between X_1 and Y except that the rational range of input of X_1 is changed. Point C is the observed relationship between input X_1 and output. This observed point is below AA and BB because the firm is in a period of transition or change to a higher level of input of X_1 associated with the addition of an additional unit of X_2. Many farming adjustments may cause such temporary drops in income. The consequences of fitting functions to such observed data are obvious. One may well argue that marginal productivity estimates in general tend to be biased downward, since the observed data include many firms in a transitional stage.

Additional inputs may involve a shift in functions. This may occur in the case of "lumpy" input or inputs that cannot be added in finite amounts. Line DD in Figure 9 represents such a possibility. Assume that the state of the arts does not change and inputs other than X_1 remain the same. Again AA is the rational portion of a function which describes the manner in which X_1 can be transformed to Y. In the same fashion DD is the rational portion of a function where greater amounts of X_1 are employed. It will be observed that a discrete break in the function is postulated. This may be the case where the technology employed is in part a function of the amount of input used. As an illustration of such a relationship, consider some of the effects of increasing inputs of power and machinery. A one-horse-one-plow farmer may double his power and machinery input by buying a second horse and plow. This increase would likely represent movement along a function. However, if he increases his power and machinery input further by the purchase of a tractor and equipment, he may well shift to a new function. There are numerous possibilities of this nature. If techniques employed are to a substantial extent a function of level of inputs (or for any other reason farmers employ a mixture of techniques) and a shift in techniques involves a shift in functions, then derived functions may well be hybrids of several true functions.

Conclusions

Marginal value productivity estimates derived from the Cobb-Douglas type function can be seriously biased by non-optimum aggregation of inputs or by non-optimum aggregation of outputs. The literature indicates that considerably more attention has been directed to problems of input aggregation than those involved in product aggregation. However, theory and observation suggest that the magnitude of bias occasioned by aggregating all products into one variable may be as great as would be the case if all inputs are aggregated.

Certainly, Cobb-Douglas functions have rather important limitations, but regardless of the specific function selected there are similar aggrega-

tion problems.[9] Any specific optimum aggregation necessarily depends on the specific properties of the selected function and the character of the data.

Value productivity estimates based on whole farm Cobb-Douglas functions may play an important and productive role in future farm management-production economics research. However, it appears that effort directed toward improving the use of any particular function, as well as toward extending knowledge of the basic underlying relationships necessary for the selection of appropriate functional forms, would yield large returns. Meanwhile, extreme caution should be exercised in suggesting intra-farm adjustments on the basis of Cobb-Douglas functions. Also, since it is not clear just how an estimating equation which is not suitable for guiding individual farm decisions can suggest optimum area shifts, the validity of policy recommendation arising from Cobb-Douglas analyses is quite questionable.

[9] Statistical-economic considerations, such as the high degree of correlation between input catgories, also tends to bias estimates, However, these questions have not been considered in the present paper.

BENEFIT-COST ANALYSIS AND PUBLIC RESOURCE DEVELOPMENT*

S. V. CIRIACY-WANTRUP
University of California

1. *A Crucial Question*

DECISIONS by the government regarding resource development are essentially political rather than economic. This holds for their substance, for the social process by which they are reached, and for the institutions through which they are implemented. This, in itself, is merely a commonplace observation of reality, neutral in terms of value judgments. But in connection with my topic, it gives rise to a crucial question.

There is fairly general agreement that benefit-cost analysis is subject to many weaknesses. There is also recognition that benefit-cost analysis can be and has been distorted and abused.[1] One may ask then: Is it worth while investing considerable effort and expense in benefit-cost analysis if the risk of misleading results is great and—even though this risk is avoided—if the results are of relatively minor significance as compared with political factors in actually affecting public resource development?

This question has been answered in the negative by individuals and groups with quite different attitudes toward public resource development. Some regard benefit-cost analysis as merely a waste. Others feel that economic measurement—being allegedly "static"—understates the "induced" benefits. Benefit cost analysis thus tends to hold public resource development at a lower level than is desirable. Therefore, instead of benefit-cost analysis, some feel that the political process should be relied upon. Still others fear that inflated benefit-cost ratios may be a pretext for the government to propose projects that are economically unsound, to be undertaken mainly for empire building of a particular agency, or to satisfy a pressure group. Alternatively, if the projects are economically sound, they should be paid for by beneficiaries. Thus, instead of benefit-cost analysis, many feel that "willingness to repay" a portion of the costs should be made the criterion for public resource development.

I should like to submit—and at this point of my paper, it is meant merely as a proposition—that this question can be answered clearly in the affirmative. This means that benefit-cost analysis by the government ap-

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[1] See Luna B. Leopold and Thomas Maddock, Jr., *The Flood Control Controversy; Big Dams, Little Dams, and Land Management* (New York: The Ronald Press Company, 1954), 278 p. Raymond Moley, *What Price Federal Reclamation?* (New York: 1955), 72 p. (Series "National Economic Problems" No. 455.)

pears worth while *in spite of* its weaknesses, its risks, and its relatively small, direct influence upon the actual course of events.

2. *Abuse of Benefit-Cost Analysis*

The first point mentioned in support of this proposition relates to distortion and abuse of benefit-cost analysis. One must keep in mind that economic and pseudoeconomic arguments are by far the most important weapons in the arsenal of opposed regional, industrial, and occupational interests contending in the political arena for or against a public project. Hence, distortion and abuse of benefit-cost analysis would not disappear if the government were to stay out of it. Quite the contrary. There would then be no calculation in which the general public could have confidence and that could be used as a standard to measure various claims. Furthermore, there would be no calculation easily open to public scrutiny in every detail. Such a standard can be provided only by a government. Even if this standard is not simon-pure, compared with an ideal standard conceived through economic theory, it still serves a worth-while purpose *to restrain the abuse of economic arguments in the political process.*

One may admit that abuse of government benefit-cost analysis is more dangerous in its consequences than abuse of private calculations because of the greater confidence placed in the government by the general public. In this country, however, abuse of the government standard is made more difficult by the variety of government institutions.

In benefit-cost analysis, as in other fields, this government is not a monolithic structure. Besides the federal government, state governments are highly important in resource development. In all these governments there is division between the executive and the legislative branches. In the federal government alone, the agencies engaged in benefit-cost analysis comprise at least four major executive departments (some of them with several fairly independent bureaus), the Federal Power Commission, and, of course, the Bureau of the Budget. Many of these government agencies have their own traditions and objectives in benefit-cost analysis. Some of them compete directly or indirectly for public funds and, therefore, take a lively interest in each other's calculations. The rivalries and duplications among various agencies are well known. From the standpoint of benefit-cost analysis, however, the results have not been all bad. Inconsistencies and conflicts are brought into the open. Mutual review and criticism encourage improvements.

3. *Quantifying in Benefit-Cost Analysis*

Benefit-cost analysis requires quantification both in physical and economic terms. Quantifying in economic terms involves evaluating on the

basis of a common denominator or weight. In practice this means money, although other denominators are conceivable and are used in economic theory.

The necessity of quantifying in terms of money is frequently pointed out as a weakness of benefit-cost analysis. One may wonder whether or not this necessity does have a positive side. Economics and the social sciences in general do not stand alone in dealing with important problem areas in which quantifying is difficult or irrelevant. On the other hand, an attempt to overcome these difficulties and to determine the relevance of quantification is an important stimulus of scientific progress. In economics, particularly, an attempt at evaluation compels the student to face and take into account his own preferences, to scrutinize whether or not he has considered all relevant variables, and to get some idea of the relations among the variables and the institutional restrictions in economic measurement.

An attempt to quantify in one science frequently has stimulating effects upon others. This holds for benefit-cost analysis. Engineers, hydrologists, ecologists, and other physical scientists who furnish the necessary basic data for benefit-cost analysis, have sometimes regarded the social scientist as an irritant if not a nuisance. But would they deny that his persistent quest for additional quantitative information has stimulated research in the physical problems of flood control, reclamation, and land management?

One may argue, therefore, that the mere necessity of quantifying makes benefit-cost analysis worth while *because of its stimulating effects in expanding scientific understanding of the physical as well as social problems involved in public resource development.* This role of benefit-cost analysis, like the preceding one of restraining the abuse of economic arguments in the political process, exists even if some weaknesses could not be overcome and if direct influences upon policy decisions should remain relatively minor.

After dealing with the two most frequent general objections against benefit-cost analysis, let us now attempt to appraise some of its weaknesses and to consider potentialities for reducing them. If these potentialities could be realized, the influence of benefit-cost analysis would be greater.

4. *Extramarket Benefits and Costs*

When the necessity of quantifying is cited as a weakness of benefit-cost analysis, two types of benefits and costs are usually mentioned or implied, "intangible" and "indirect" or "secondary." The evaluation problems posed are theoretically intriguing and of considerable practical significance. Next to problems of cost allocation,[2] such evaluation raises the

[2] See S. V. Ciriacy-Wantrup, "Cost Allocation in Relation to Western Water Policies," *This Journal*, Vol. XXXVI, No. 1, February, 1954.

most controversial problems of benefit-cost analysis among students and government agencies.

In this paper, I should like to focus on these two problems. The problem of "intangibles" is considered first because its discussion touches upon the more basic weaknesses of benefit-cost analysis.

At first glance, one portion of benefits and costs appears rather obvious and simple to evaluate. Such items are usually called "tangible." Examples are the value of cotton produced by an irrigation project and the costs of the cotton, the dam and the productive agricultural areas flooded by the reservoir. On the other hand, if the project water is to be used to rehabilitate wintering grounds for waterfowl such as the "grasslands" in the western San Joaquin Valley, if the dam interferes with anadromous fisheries as in most rivers of the Pacific Slope, and if a reservoir floods a canyon, a "product" of which is impressive scenery as in the Upper Colorado Storage Project as presently proposed, these benefits and costs are usually called "intangible."

The price of cotton, of course, is reported every morning in the newspapers. Similarly, the current prices of raw materials, the wages, and the interest rates, used in computing the costs of the cotton and of the dam can easily be ascertained. The same holds for the price of an acre of agricultural land that is flooded. However, if such unit values yielded directly by the market are to be used in public resource development, such use is by no means obvious and simple. At this point, I do not refer to the problems connected with elasticities of demand and supply, with economic fluctuations, with changes over time of preferences and technology, and with the uncertainties attaching to all these estimates. Solution of these problems is not simple, but practical approximations can be found. More basic difficulties are created by the fact that the functioning and results of the price system itself are profoundly affected by aggregate income, income distribution, and market form. These, in turn, are affected by a host of social institutions having an important and highly complex status in individual preference systems.

For some purposes, it makes sense in economic analysis to regard properly defined institutional conditions as dependent or independent variables. For example, relations among the systems of tenure, taxation, and credit on one side, and resource development on the other, may usefully be discussed in this way. Similarly, the effects of changes in particular statutes or government organization can be studied.[3] On the other hand, for purposes of benefit-cost analysis—which comprises only a small part of economic analysis—most social institutions can only be

[3] These and other examples are discussed in greater detail in S. V. Ciriacy-Wantrup, *Resource Conservation, Economics and Policies* (Berkeley: University of California Press, 1952), 395 p.

brought into the calculation as logical restrictions (constraints). This means that benefit-cost analysis has relevance for an economic criterion of public resource development only under "given" institutional conditions. The investigator should be clear about this even if he does not state the significant institutional conditions explicitly.

Institutional restrictions on the validity and relevance of values directly yielded by the market are far more severe than the additional restrictive assumptions that become necessary if evaluation is extended to those benefits and costs not evaluated directly in the market place. One may wonder whether or not economists are justified in placing great confidence in the validity and relevance of the price of cotton, for example, in evaluating water resource development, and rejecting the evaluation of recreational opportunities as belonging to the field of metaeconomics.

The implied conclusion is not that benefit-cost analysis of "tangibles" should be given up. Rather, in accordance with the over-all role of benefit-cost analysis suggested above, evaluation procedures should be tightened but not necessarily confined to goods whose values are directly yielded by the market. The semantics of the terms "tangible" and "intangible" reflect and strengthen confusion and emotional attitudes in matters of evaluation. Various evaluation procedures range from those that use market values directly to those that use market values with considerable adjustments, or only indirectly.

In public resource development in this country at the present juncture, recreational opportunities in a broad sense—including fish and game, wilderness areas, and national and state parks—are some of the items among extramarket values that may well be considered in benefit-cost analysis. Whether the economist likes it or not, evaluation of these items (and also dismissal of such evaluation) is already a part of the political process. Reports of fish and game departments and other public agencies illustrate many attempts to evaluate these resources. One may have professional doubts about some of the procedures used. Still, these attempts should be encouraged. Otherwise, the arguments of well-organized groups interested in market values alone, who dismiss these resources as "intangible," might receive disproportionate attention in policy decisions.[4]

This is not to suggest that *all* benefits of recreational resources could be evaluated. In connection with many such resources, however, market

[4] In order not to be indicted of subjective bias in favor of recreational resources, a recent attempt to evaluate another item—still more problematical but related, namely, leisure—may be cited: Simon Kuznets, "Long-Term Changes in the National Income of the United States of America Since 1870," in *Income and Wealth of the United States, Trends and Structure, Income on Wealth, Series II* (Cambridge: Bowes & Bowes, 1952). See especially pp. 63-69.

values can be used indirectly—for example, through analyzing data on fees, leases, and real estate transactions. In other cases, measurement in terms of physical units of use—for example, man-days—can be accomplished fairly easily. Values of additional units of use can be approached through questionnaires and the study of behavior in other experimental choice situations. Even such crude and partial measurement is more useful than disregarding these values altogether, or substituting for them some figure based on the expenditures of users for transportation, room and board, guns, fishing tackle, and similar items.

5. *Primary (Direct) and Secondary (Indirect) Benefits and Costs*

Let us now turn to the problem of indirect benefits and costs. Although this problem is some times confused with that of "intangibles"—the terms "indirect" and "intangible" are even used interchangeably—there is little relation between the two. Most indirect benefits and costs considered in benefit-cost analysis are evaluated in the market place. But this is not the issue. The issue is whether or not, and for what purpose, indirect benefits and costs should be considered and added to direct ones.

First, what is the meaning of direct and indirect benefits and costs? We may adopt the definition and terminology of the Subcommittee on Benefits and Costs of the Federal Inter-Angency River Basin Committee.[5] According to this definition, direct costs are the value of the goods and services needed for the establishment, maintenance, and operation of the project and to make the immediate products of the project available for use or sale.[6] Direct benefits are the value of the immediate products and services for which the direct costs were incurred. Indirect benefits are the values added to the direct benefits as a result of activities "stemming from or induced by" the project. Indirect costs are the costs of further processing and any other costs (above the direct costs) "stemming from or induced by" the project. The Subcommittee prefers the terms "primary" and "secondary," instead of "direct" and "indirect," presumably because in the economics of flood control the terms "indirect" or "incidental" have for some time been used in connection with products (other than the prevention of direct flood damage) which, in the terminology of the Subcommittee, must be regarded as "immediate."

Three problem areas are as important in appraisal of secondary benefits

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[5] Subcommittee on Benefits and Costs, *Proposed Practices for Economic Analysis of River Basin Projects* (Washington: May, 1950), 85p. (Report to the Federal Inter-Agency River Basin Committee). See particularly pp. 8 and 9.

[6] The latter costs are called "associated costs," but this differentiation is not material for our present purpose.

and costs as in discussion of cost allocation.[7] The first problem area is the selection of the "best" project; the second is the repayment by beneficiaries to the government; the third is the pricing of those immediate products of a project that are sold. These problem areas are connected in benefit-cost analysis through economic concepts, some common basic data, and existing statutory provisions. But the potentialities and limitations of benefit-cost analysis differ among these three areas, the concepts and basic data needed are not all the same, and the statutory provisions that connect them are neither precise nor unchangeable. This paper is concerned mainly with the two problem areas of project selection and repayment. The problem area of pricing is excluded because of space limits, not because it is less important.

For purposes of project selection, benefits or costs that constitute transfer items among regions, among industrial or occupational groups, and among individuals, should not be considered. Whether or not such transfers are desirable is a separate issue in public policy. Considerations concerning income distribution will appear in clearer focus if they are separated from the problems of increasing real national income. An account in which transfer items are not considered may be called a "national" account.

On the other hand, repayment of net benefits to certain regions, to industrial or occupational groups and to individuals may well be considered even if they are transfer items. Such repayment accounts will generally be on the basis of regional, industrial, or occupational groupings. For that reason, they may be called "regional" or "industry" accounts. The significance of differentiating among these various accounts will appear presently.

6. *Secondary Benefits "Stemming from" a Public Project*

The many kinds of secondary benefits (and costs) considered in the literature[8] and practice of benefit-cost analysis may be divided into two

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[7] Ciriacy-Wantrup, "Cost Allocation in Relation to Western Water Policies," *op. cit.*

[8] Subcommittee on Benefits and Costs, *op. cit.*

Secondary or Indirect Benefits of Water-Use Projects (Washington: June 26, 1952), 63p. (Report of Panel of Consultants to Michael W. Straus, Commissioner, Bureau of Reclamation.)

U. S. Congress, House, *Economic Evaluation of Federal Water Resource Development Projects* (Washington.: Govt. Print. Off., December 5, 1952), 55p. (82nd Cong., 2d sess., Report to the Committee on Public Works by the Subcommittee to Study Civil Works.)

Executive Office of the President, U. S. Bureau of the Budget, *Reports and Budget Estimates, Relating to Federal Programs and Projects for Conservation, Development, or Use of Water and Related Land Resources* (Washington: Govt. Print. Off., December 31, 1952), 20 p. (Circ. A-47.)

M. M. Kelso, "Evaluation of Secondary Benefits of Water Use Projects," *Water*

major classes. The first comprises those alleged to accrue in connection with the processing of the immediate products; this class is referred to by the term "stemming from." The second class comprises those benefits (and costs) alleged to accrue because expenditures by the producers of the immediate products stimulate other economic activities; this class is referred to by the term "induced by."

Let us start with secondary benefits from processing.[9] Under competitive markets, net benefits arising from processing (above all corresponding costs of processing) quickly find expression in the demand by processors for the immediate products of a project. In connection with public resource development, a demand function may be identified with a marginal benefit function. An estimate of the demand function for the immediate products of a public project is, therefore, the most essential basic step in considering primary benefits.[10] Hence, if by some more or less arbitrary accounting procedure secondary net benefits from processing are determined and added to the primary net benefits, a portion of primary benefits is counted twice.[11]

If "abnormal" profits would be derived from processing the products of a public project under monopsonistic or monopolistic markets, there are several possibilities. This situation can sometimes be avoided by expanding the "project." Processing facilities—for example, for transporting power—may be included as a part of public resource development. In other cases, competition may be encouraged by appropriate public policies. Many opportunities for such action exist because the government either is the producer or has considerable influence with the producers to set up processing facilities on a cooperative basis.

If this approach is not chosen, correction for these market conditions may be made in benefit-cost analysis. If the problem area is project selection, such correction should be made through the demand function used as the basis for computing primary benefits. In such a computation quan-

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Resources and Economic Development of the West (Berkeley, California: March 2-3, 1953), pp. 49-62. (Proceedings, Committee on the Economics of Water Resources Development of the Western Agricultural Economics Research Council, Report No. 1, Research Needs and Problems.)

[9] In the case of power, these benefits are sometimes subdivided further under the terms "savings benefits," "extended benefits," and "utilization benefits." See *Trinity River Division, Central Valley Project, California* (Washington: Govt. Print. Off., 1953), pp. 73-75 (83d Cong., 1st sess., H. Doc. 53.)

[10] For more details on this point, see Ciriacy-Wantrup, *Resource Conservation, Economics and Policies*, Chapter 17.

[11] In arriving at secondary benefits, it has become customary to apply standard percentages to the primary benefits. These percentages are derived from the statistics of average values added in processing. Thus, for cotton and other industrial raw materials produced by a public irrigation development the percentages are high (80 per cent and more), and smaller for livestock products.

tities and values used "as if" markets for the immediate products were competitive. To construct such a demand function, data are required on revenues and costs in processing. But such data are also required for identifying "secondary benefits" from processing.

If the problem area is repayment, net income in processing industries "stemming from" the public project may be identified as secondary benefits in regional or industry accounts. However, benefit items in these accounts should not be added to benefit items in the national account.

Identification of secondary net benefits in industry or regional accounts stimulates a better understanding of regional effects of public resource development. Such identification has practical significance as a preliminary step toward broadening the repayment base—which is sometimes rather narrow if confined to primary benefits—toward obtaining dependable repayment contracts from groups of beneficiaries, and toward making special taxes socially more acceptable. The term "preliminary" is used because the problem area of repayment is dominated by social institutions. Benefit-cost analysis in itself can only call attention to their economic aspects and thereby facilitate changes.

Sometimes people argue[12] that secondary net benefits from processing arise from the fact that the goods produced by a public project may lower market prices. Since the immediate products are available to processors at lower prices, the project should then receive a credit for secondary net benefits equal to the price differentials times the quantities produced. Some question may be raised about this argument.

The quantities produced by a public project of course may be large enough to have effects upon prices; but such a situation in itself does not indicate additional profits from processing. At best, such additional profits are short-lived. The quantities produced by the project should be evaluated with the prices at which these quantities can be absorbed.

On the other hand, the project should not be debited with the effects of price decreases of "intramarginal" quantities—that is, of quantities that would be produced without the project. Such price effects of a project, both through products supplied and services demanded, are transfer items among producers and consumers that should not be considered in benefit-cost analysis for purposes of project selection. For purposes of repayment, on the other hand, net income resulting from such effects may be considered as secondary benefits in industry or regional accounts.

7. *Secondary Benefits "Induced by" a Public Project*

Next, let us consider the other major class of secondary benefits, namely, those from an expansion of economic activity "induced by" the public

[12] For example, Subcommittee on Benefits and Costs, *op. cit.*, pp. 10 and 40.

project. This is a more complex and more important problem than the preceding one.

The argument for including this class of secondary benefits is supported on the academic level through analyses based on Keynesian economics. In the practice of benefit-cost analysis, however, this class of benefits is computed regardless of underemployment among productive services, in the course of general fluctuations of investment, saving, and income. First, therefore, it is advisable to deal with this class under the assumption that there is no "cyclical" underemployment.

This assumption does not mean that there is no unused capacity. In reality, an economy is in constant change even if aggregate investment, saving, and income are assumed constant. In such an economy, there is always unused capacity, not only in industries in a state of stagnation or decay but also in those in a state of growth, because growth rates are different in interrelated activities. Furthermore, such "structural" underemployment is generally concentrated in particular industries and regions. Public resource development can, under some conditions, help in making use of such underemployed services.

The most logical and practical way to take such effects into account for benefit-cost analysis is through evaluation of primary costs—not through secondary benefits. Under competitive markets, the fact that productive services are underemployed is reflected in the prices at which they are available—*in situ* or including costs of movement—to the public project. Under monopolistic markets, this may not be true. In such cases, appropriate corrections can still be made through the supply functions of productive services used as a basis for computing the primary costs. If data are not sufficient to estimate prices of productive services "as if" their markets were competitive, an "offset" to primary costs may be calculated in connection with cyclical underemployment. This procedure is indicated for the problem area of project selection.

For the problem area of repayment, such effects may be identified as secondary benefits through income statistics. But again, care should be taken that such benefits are not counted twice—that is, are taken into account both on the cost and on the benefit side. Besides income statistics, some new techniques of economic analysis—for example, Leontieff's input-output model—may become helpful in the *ex ante* identification of such induced secondary benefits.

People frequently argue that secondary benefits are induced regardless of underemployment of productive services, cyclical or otherwise. Public resource development—for example, irrigation development in an arid region—may certainly induce many new economic activities. Under the assumptions of no underemployment and no change in technology and preferences, one may doubt that this increase is "net" for the national

account. In other words, such increases are offset by decreases elsewhere in the economy. Hence, the increases may be considered for repayment but not for project selection.

On the other hand, public resource development may, over time, induce economic change in a broader sense. That is, it may change technology and preferences and thereby induce shifts of supply and demand schedules for the immediate products of a project. Some argue that such changes should be taken into account in benefit-cost analysis through secondary benefits (or costs) and that otherwise such analysis would remain "static."

Admittedly, the instantaneous supply and demand schedules used as basis for benefit-cost analysis involve highly restrictive assumptions with respect to future economic change. Far too little is known about the conditions of economic change to trace in practice a continuous "path" over time in terms of expected benefits and costs functionally related to public resource development. On the other hand, benefit-cost analysis may well be undertaken within discrete consecutive time periods—each involving different but interrelated assumptions. I have shown elsewhere that such time-period analysis and explicit consideration of the future are basic issues in resource economics.[13] The "pay-out schedules" commonly used in benefit-cost analysis may well be refined with respect to expected shifts in supply and demand for the immediate products of a project.

Only a part of the change in these assumptions from period to period will be related to the effects of public resource development itself. In this country especially, the effects of other forces are far more important. There are practical limits on the number and extent of periods and assumptions considered. Still, the fact remains that long periods of gestation—at least ten and usually closer to twenty years from the time of project selection—make emphasis on future rather than past conditions of supply and demand a necessity in public resource development. Improvements in the direction of a period analysis of primary benefits and costs would seem more meaningful than attempting to make benefit-cost analysis "dynamic" through a more or less arbitrary addition of secondary benefits and costs—which are "static" in the same sense as alleged for primary ones.

Finally, there is fairly general agreement that public resource development can have secondary beneficial effects under the assumption of cyclical underemployment and should be considered from the standpoint of integration with other more direct and more effective anticyclical policies. The possibilities and difficulties of such integration need not be con-

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[13] Ciriacy-Wantrup, *Resource Conservation, Economics and Policies*, Chapters 3 and 4.

sidered here.[14] In connection with the present topic, the issue is: How much should these beneficial effects be taken into account in benefit-cost analysis?

As in the case of structural underemployment discussed above, the most logical and practical way to take such effects into account is through evaluation of primary costs—especially construction costs—not through secondary benefits. Public resource development is most effective in reducing cyclical underemployment during the construction period. By taking the state of employment into account in the evaluation of construction costs, public projects will appear economically more attractive during depressions and less attractive during booms. This is because no corresponding adjustment should be made in benefits. As just emphasized, benefits from a public project start to flow only after a long period of gestation. Even if this start does not coincide with the next boom phase, it can be assumed that the flow continues over several "cycles."

Under competitive markets, cyclical underemployment of productive services is reflected in the prices of such services. Under monopolistic (monopsonistic) markets, this is not likely. Still, adjustments can often be made in the computation of construction costs by using prices for productive services "as if" their markets were competitive. Alternatively, a sliding-scale "offset" to primary costs may be calculated.

The Panel of Consultants suggested that such an offset be added to construction costs. This offset is calculated by multiplying construction costs with a plus (full employment) or minus (unemployment) factor which is "the percentage of the resources used in construction of this project which is estimated will be drawn from unemployment rather than diverted from other uses."[15]

Although this method seems in need of clarification, there is no conflict in logic between it—if properly used—and the method that tries to take underemployment into account directly through prices of productive services used in the evaluation of construction costs. The method suggested by the Panel may be regarded as a first approximation to the other method. Care should be taken, however, that underemployment is not taken into account twice—that is, through prices used in evaluating construction costs *and* through the offset factor. Because of this danger, I prefer the more direct method. Also, practical advantages in obtaining basic data are probably in favor of this method—except in the case of labor costs.

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[14] *Ibid.*, Chapter 15.

[15] Kelso, "Evaluation of Secondary Benefits of Water Use Projects," *op. cit.*, p. 56. A similar statement and illustrative graph appear in the Panel report itself (*Secondary or Indirect Benefits of Water Use Projects, op. cit.*, pp. 31 and 32). However, these statements do not clarify how a positive factor is calculated.

8. *Conclusions*

When one tries to draw conclusions from this analysis of secondary benefits and costs, one is forced to suggest that all classes of secondary net benefits be dropped from consideration if the problem area is project selection. This is the most important problem area in which benefit-cost analysis is presently used.

This suggestion may seem to reflect an overly conservative if not negative attitude toward public resource development. This is not at all the case. But the effort presently invested in justifying the inclusion of secondary benefits and costs in the national account could be employed to greater advantage in a more careful evaluation of primary benefits and costs.

This advantage would accrue to the twofold over-all role of benefit-cost analysis indicated above, especially the first one of restraining the abuse of economic arguments in the political process (Section 2). Secondary benefits and costs have for some time been suspected by legislative bodies as facilitating double counting and other forms of "padding" benefits.[16] If the foregoing analysis is correct, these suspicions are not unfounded. Elimination of secondary benefits and costs in the national account would make benefit-cost analysis more straightforward, not only for the professional economist but also for the layman. The influence of benefit-cost analysis with legislative bodies and the public at large may thereby be increased.

Beyond that, advantages may accrue to the second over-all role of benefit-cost analysis, that of stimulus to scientific understanding (Section 3). There are few issues in benefit-cost analysis that force the student to ask more searching questions regarding public resource development than a critical appraisal of secondary benefits and costs in their relation to primary ones.

Another conclusion to be drawn is the need for a clear differentiation among problem areas, or purposes, of benefit-cost analysis (Section 5). Some items that should not be considered for project selection may well be considered for repayment. For other items, the reverse may be true. For example, recreational benefits should be considered for project selection (Section 4), but as a matter of policy or practical expediency they may be omitted for repayment.

The twofold over-all role of benefit-cost analysis appears no less important for repayment than for project selection. Most of the economic arguments by interested regional, industrial, and occupational groups are

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[16] See, for example, *Economic Evaluation of Federal Water Resources Development Projects, op. cit.*

concerned with repayment. A government "standard" in the above sense (Section 2) is especially needed in this problem area.

Establishing regional and industry accounts, as discussed for benefit-cost analysis of repayment (Section 6), stimulates research in the regional effects of public resource development, in the factors affecting the economic growth and location of industries, and in the social institutions—as variables and as restrictions (Section 4)—that dominate the criteria, the form, and the assessment of repayment.

Practical influences of benefit-cost analysis—in broadening the repayment base, in obtaining dependable repayment contracts, and in making public districts and special taxes more acceptable—exist insofar as appropriate changes of social institutions are facilitated. The latter influences are largely educational and must operate through the political process.

Such indirect and modest influences may seem to give support to the proposal mentioned in the beginning (Section 1), to adopt "willingness to repay" as a more direct and effective substitute for benefit-cost analysis. If this "willingness" were affected primarily by economic factors, ascertaining it would require an effort similar to that for benefit-cost analysis. But "willingness to repay" is more akin to "requirement to repay" as determined by statutory provisions, precedent, and political influence of beneficiaries. It makes little sense to employ or even to define "willingness to repay" as an economic criterion. Through benefit-cost analysis, on the other hand, an economic upper limit of "willingness to repay" can be determined. Furthermore, through benefit-cost analysis, the political lower limit of "willingness to repay" may be raised through the indirect and modest influences suggested above.

We conclude that there is no substitute for benefit-cost analysis in public resource development. Its role in the actual course of affairs may be unspectacular but properly used the effort is worthwhile. Furthermore, there are potentialities for improvement that may render the practical influence of benefit-cost analysis considerably more potent.

CONSUMER DEMAND FOR CIGARETTES ESTIMATED FROM STATE DATA*

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THE purpose of this investigation is to increase the empirical information available for making estimates of the responsiveness of the rate of cigarette consumption to changes in the retail prices of cigarettes. Such estimates of the price elasticity of demand for cigarettes in the United States for the post-war high-income period are desirable both for the nation-wide market and for the individual state markets. The measurement of consumer demand for cigarettes is a matter of considerable importance in determining policy in respect to federal and state excise-tax rates on cigarettes and in determining other public policy affecting the production and marketing of tobacco.

Other Studies

Although "everyone knows" that the demand for cigarettes in the nation-wide U. S. market is highly inelastic with respect to price, rather little empirical work has been directed toward the question of just how price inelastic cigarette demand is.

The first published statistical study of this question known to the writer is that by E. H. Schoenberg reported in 1933.[1] One phase of this investigation related per capita cigarette consumption to real price and to "time" for the period 1913 to 1931. The coefficient of partial regression of per capita cigarette consumption of real price that this procedure yielded was a decrease of 11.3 cigarettes per person for each 1-cent increase in real price per pack of 20. This implies a price elasticity of demand of approximately −0.25 at the means. The other phase, covering only the period 1923-31, related per capita cigarette consumption to real price, to time, and to advertising. This procedure indicated a coefficient of partial regression of consumption on price that was a decrease of 40.2 cigarettes per person per year for each 1-cent increase in price, implying a price elasticity of demand of −0.68 at the means. Schoenberg reported

* This article is based on a portion of the research in tobacco marketing carried on at Vanderbilt University under an RMA contract with the U. S. Department of Agriculture. The author at that time was Visiting Assistant Professor of Economics at Vanderbilt University.

For suggestions and helpful criticisms in the development of the phase of the research reported here, the author is especially indebted to Arthur G. Conover of the Statistical and Historical Research Branch, Agricultural Marketing Service, U. S. Department of Agriculture and to Leon Rothenberg of the Federation of Tax Administrators.

[1] E. H. Schoenberg, "The Demand Curve for Cigarettes," *Journal of Business*, 6 (January 1933), 15-35.

that his correlations were not improved by introducing an index of earnings as an additional variable.

From the vantage point of the 1950's, however, one is inclined to be somewhat critical of Schoenberg's statistical procedures and to doubt the relevance of his results to today's situation. The implication that personal incomes have no influence on the rate of consumption of cigarettes now disagrees with suggestions arising from cruder inspection of a longer period of experience. The fortuitous occurrence of high cigarette prices simultaneous with very low incomes in two years (1930 and '31) out of the nine years (1923-31) would attribute more importance to price in the multiple regression than would seem logical. Also, in both phases of Schoenberg's study the presence of some correlation between incomes and time would tend to obscure the influence of income on consumption of cigarettes.

In a Treasury Department study, *Federal Excise Taxes on Tobacco*, published in February 1948, price elasticity of demand for cigarettes was estimated to have been approximately −0.10 for the period 1929 to 1943 and income elasticity of demand to have been several times larger.[2] These estimates were apparently based on a multiple regression of consumption on income, price, and trend for the nation as a whole; but few details were published about the procedures employed and the statistical results obtained.

An analysis of the demand for cigarettes has been made in the Agricultural Marketing Service, U. S. Department of Agriculture, by George R. Rockwell, Jr., based on year-to-year changes in national time-series data from 1927 through 1941. Rockwell estimated the price elasticity of demand for cigarettes to be approximately −0.3.[3] The author has been informed that the income elasticity of demand obtained in Rockwell's study was approximately +0.5.

Some Theoretical Considerations

At the outset some attention should perhaps be given to relationships between the theoretical definitions of demand and the comparable operational definitions that were employed in the statistical analyses about to be reported here.

First, since a demand curve always has reference to a certain specific market area, it will be necessary to distinguish between retail demand for cigarettes (1) in the nation-wide market and (2) in individual state-

[2] Division of Tax Research, U. S. Treasury Department, *Federal Excise Taxes on Tobacco*, Washington, D.C., 1948, pp. 15-16.

[3] Karl A. Fox, *The Analysis of Demand for Farm Products*, U. S. Department of Agriculture Technical Bulletin No. 1081 (Washington: Government Printing Office. 1953), p. 69.

wide markets. Price elasticity of demand for cigarettes in the nation-wide market probably differs from that in any one of the statewide areas. Not only do consumers' tastes and incomes differ from state to state, but also in each individual state there is a much greater possibility of divergence between actual consumption and actual purchases than in the nation-wide market—because of the possibility of mail-order purchases from and of "smuggling" out of adjacent low-tax states.

Second, a coefficient of price elasticity of demand has reference, theoretically speaking, to a certain specified point along a demand curve and, practically speaking, to a certain narrow range along it. Since there is no *a priori* reason to expect either the slope or the elasticity of the demand curve to be the same in all ranges of retail price, it is not possible to extrapolate an empirically-derived demand curve into the ranges of price not observed in the data. Similarly, since in a given price range the demand curve of a market with high real incomes may be different from that with low incomes, it is also not safe to extrapolate much beyond the observed range of income.

Finally, a given demand curve implies a period of time sufficient for consumers to make specified adjustments in their purchases of various other kinds of goods and services. A short-run demand curve might be defined as having reference to a time period in which consumers are able to alter their rates of consumption of all commodities except consumer durables—analogous to the Marshallian short-run production period in which the firm cannot change its plant. A long-run demand curve would comprehend a period of time after a price change sufficient for consumers to alter their rates of consumption of all commodities. Since consumers probably entertain more "money illusion" in the short run than in the long run, a demand curve that approaches the long run may be expected to refer approximately to real-price relationships. The price influence indicated by the cross-section analysis of annual purchases of cigarettes within each of the several states during a certain year may be presumed to approximate a semi-long-run period in which the rates of consumption of only a small number of consumer durables are fixed and in which "money illusion" would in large part be dissipated—since cigarettes are purchased by the individual consumer on frequent occasions, since they represent a small fraction of his total income, and since each state typically changes its cigarette tax only once in several years. Such a period would in fact also be relevant to most aspects of public policy.

Cross-Section Analysis of State Data on Cigarette Purchases, Considering Per-Capita Income and Retail Cigarette Prices Within Each State

Since the previously cited studies analyzed time-series data of national consumption, in this study an alternative geographic-cross-section ap-

proach was employed to consider the following items of information about each of the included states for a given calendar year:

Purchases of cigarettes on which the state cigarette tax was paid
Size of the civilian population residing within each state
Age distribution of the population
Personal income per capita
Estimated average retail cigarette price, including federal and state excise taxes
Rural-urban composition of the population
Sex composition of the population
Retail cigarette prices in adjoining states

Cross-section analyses of annual state data were performed separately for each of the years 1947 through 1951. The most recent years were chosen, both because of their presumed greater similiarity to present and future conditions and because state cigarette taxes have only recently become sufficiently widespread to provide the data necessary for this type of analysis. Only states that impose cigarette taxes and report cigarette-tax revenue separately from other revenue could be included in this statistical analysis, since there is no other source of information on cigarette consumption by states. The war years and the first post-war years were excluded because of the existence of price ceilings on cigarettes and dealer rationing of cigarettes. The following factors, each of which doubtless exerts some influence on the volume of annual tax-paid cigarette purchases in each of the several states, could not be included:

Prevalence of mail-order purchases of cigarettes by residents of high-tax states from firms in low-tax or no-tax states catering to a price-conscious clientele desirous of avoiding state cigarette taxes
Municipal cigarette taxes, which increase retail cigarette prices in cities imposing such taxes
Purchases by military and naval personnel of cigarettes in post-exchanges free of state tax, when such purchases are for resale to civilians
Efficiency of administration, enforcement, and collection of cigarette taxes in each state
Length of time the tax has been in effect in each state
Average wholesale and retail markup in each state

"Annual Civilian Cigarette Purchases per Civilian Age 15 and Over" (X_1) was the dependent variable measuring cigarette consumption within a state. A civilian-per-capita basis was preferred to a per-capita measure reflecting purchases by both civilians and military personnel, because members of the armed forces stationed at posts within the various states probably for the most part purchase cigarettes in post exchanges free of state taxes—which purchases are therefore not included in figures on tax-paid cigarette sales within a state. Since the several states differ consider-

ably in the age distribution of their population, the measure of state cigarette consumption should be based on the number of civilians of smoking age. Because of the age breakdown employed by the Census, "smoking age" was arbitrarily defined as "age 15 and over."[4]

Among the independent variables, "Annual Income per Capita" (X_2) rather than "annual income per person age 15 and over" was used as the measure of income differences among the states. Since states differ considerably in the proportion of children in the population, and since persons in all age groups must be provided for out of society's real output of goods and services, the measure that better reflects a state's level of general material well-being is the one to be preferred.[5]

Data on the amounts of the respective state cigarette taxes per pack of 20 cigarettes were the best available to measure differences from state to state in the "Retail Price of Cigarettes" (X_3)—or, more accurately, to measure differences among levels of the retail-price-structures for cigarettes in the several states. This expedient is partially justified by the facts that each manufacturer charged the same list price (FOB wholesaler's warehouse) throughout the United States for a given brand and that standard brands had virtually identical list prices and exactly identical discount privileges.[6] The average wholesale and retail markup doubtless differs slightly from state to state, however, due to variations in competitive market forces at these levels and the existence in several states of statutes governing minimum legal retail cigarette prices. Also, economy-brand cigarettes probably do not represent the same proportion of all cigarette

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[4] The data for "Annual Civilian Cigarette Purchases per Civilian Age 15 and Over" (X_1) were computed for each state included in the analysis by dividing total tax-paid retail cigarette sales for the year in question by the civilian population age 15 and over for that year.

Tax-paid retail sales of cigarettes were computed for the respective states for each of the years by dividing receipts from the cigarette tax by the tax rate, with appropriate adjustments for discounts allowed to dealers for affixing the state stamps. When rate changes occurred during a calendar year, a weighted average rate for the year was employed, the weights being in proportion to the period of time each rate was in effect. Detailed state information as to revenue from the cigarette tax, tax rates, effective dates of rates, and discounts to dealers for affixing the state stamps was obtained from mimeographed releases and correspondence from the National Tobacco Tax Association, which is within the Federation of Tax Administrators, 1313 E. 60th Street, Chicago 37, Illinois.

Estimates of the civilian population age 15 and over were made for each year for each state from Census' *Current Population Report*, P-25, No. 47; from information on age distribution by states in the 1950 Census; and from other Census sources.

[5] The data for "Annual Income per Capita" (X_2) were obtained from Department of Commerce estimates of calendar-year per-capita income payments by states, published in the *Survey of Current Business* in the August issue of the following year.

[6] William H. Nicholls, *Price Policies in the Cigarette Industry* (Nashville: Vanderbilt University Press, 1951), pp. 152-153.

sales from state to state. The relative unimportance of economy brands since World War II—less than one percent of total U. S. domestic consumption[7]—renders this discrepancy insignificant.[8]

The rural-urban composition of the states was measured by "Percent Urban" (X_4), as defined in the 1950 Census and as reported for April 1, 1950. "Males per 100 Females" (X_5) measured the sex composition of the states' populations as of April 1, 1950.

The initial hypothesis was that, in a given state during a short period of time, the rate of civilian cigarette consumption per person of smoking age can be accounted for by referring to the following characteristics of the states: income per capita, retail cigarette prices, rural-urban composition, and sex composition. The statistical procedure was to fit a linear multiple-regression equation to the data for each year. A linear equation was deemed appropriate, since graphic multiple-regression techniques yielded no suggestion of curvilinearity in the net relationships of each of the independent variables to the dependent variable.[9]

A single-equation approach rather than a simultaneous-equation approach is believed to be applicable here, since all the variables except the dependent variable, rate of cigarette purchases within each state (X_1) are "predetermined" in the sense that their current values are not affected by the current values of other variables in the regression equation. Income per capita within each state, for the states included in this analysis, is for all practical purposes unaffected by the amount of cigarette tobacco grown or the number of cigarettes manufactured in each state.[10] A state's cigarette tax and therefore its retail cigarette prices may be regarded for all practical purposes as unaffected by the state's rate of cigarette con-

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[7] *Ibid.*, pp. 142-143.

[8] Data for each state's rate of tax on cigarettes, reflecting state-to-state differences in "Retail Cigarette Prices" (X_3), were obtained from releases of the National Tobacco Tax Association.

[9] No evidence of curvilinearity was found over the ranges of variation in the independent variables. If the ranges of variation in income (X_2) had been greater, curvilinearity might have become apparent—as has been found to be the case with real income as a determinant of Canadian cigarette consumption over a period of 32 years, in a study of Canadian demand for cigarettes conducted by the writer.

[10] Of the seven states that are important producers of cigarette leaf—Maryland, Virginia, North Carolina, South Carolina, Georgia, Kentucky, and Tennessee—only the latter two states could be included in the analysis, since these were the only states that both taxed cigarettes and also separately reported revenue from cigarette taxes. The total farm value of cigarette leaf grown in these two latter states was small relative to the total income payments to individuals, this percentage in 1950 being 6 percent for Kentucky and 2 percent for Tennessee. The two states producing more than four-fifths of all the cigarettes that are manufactured in the United States—Virginia and North Carolina—do not tax cigarettes and for that reason had to be excluded from the analysis.

sumption, since state legislators (who in recent years have been extremely hard pressed to find sources of tax revenue) are probably more concerned with how interested parties react at the ballot box than with the insignificant effect that the rate of state cigarette tax may have on the volume of tax-paid sales of cigarettes within their state. Finally, the rural-urban composition of the several states and their sex composition are also exogenous variables.

Attention was first directed toward the question of whether or not the two independent variables, Percent Urban (X_4) and Males per 100 Females (X_5), should be dropped from the regression equation. For each of the individual calendar years 1947 through 1950, the residuals from the linear multiple regression of Cigarette Purchases (X_1) on Incomes (X_2) and Prices (X_3) were plotted in turn against Percent Urban (X_4) and against Males per 100 Females (X_5). In none of the four years was any net association between Purchases (X_1) and either Percent Urban or Males per 100 Females apparent to the eye. As a verification of these visual tests, the partial-correlation coefficients for a linear regression equation of the form $X_1 = a_{1.2345} + b_{12.345}X_2 + b_{13.245}X_3 + b_{14.235}X_4 + b_{15.234}X_5$ and the multiple-regression coefficients with and without these variables were computed by the method of "least squares" from data of the calendar year 1950, with the following results:

$$r_{12.345} = +0.470 \qquad r_{12} = 0.649$$
$$r_{13.245} = -0.104 \qquad R_{1.23} = 0.656$$
$$r_{14.235} = -0.039 \qquad R_{1.234} = 0.660$$
$$r_{15.234} = +0.041 \qquad R_{1.235} = 0.660$$
$$R_{1.2345} = 0.661$$

For these partial correlation coefficients, the 5 percent significance level would be 0.312 by a one-tailed test of significance. Only the income partial correlation coefficient ($r_{12.345}$) is significant at the 5 percent level. The sign of the $r_{14.235}$ coefficient is opposite to the traditional expectation that urban people smoke more heavily than rural people. The two independent variables, Percent Urban (X_4) and Males per 100 Females (X_5), were for these reasons dropped from the multiple regression equation at this point.

A linear multiple-regression equation with only income and price as the independent variables yielded the results shown in Table A when fitted to annual state data for each of the years. The poorness of the fit of these multiple-regression equations is conspicuous. Only between 36 percent and 46 percent of the variation in Purchases (X_1) about the mean is explained by the independent variables Income (X_2) and Price (X_3). Such a low R^2 with the geographic-cross-section analysis of state data is

in contrast to the results of several investigations employing the time-series analysis of national data.[11]

Because of their contrasting methods, the cross-section analysis of annual state data must be expected to yield both lower multiple-correlation coefficients and lower partial-correlation coefficients than the time-series analysis of national data. First, with national data it is possible to "measure" some of the changes in consumer tastes, such as shifts in the de-

TABLE A. RESULTS OF FITTING THE EQUATION $X_1 = a_{1.23} + b_{12.3}X_2 + b_{13.2}X_3$ TO ANNUAL STATE DATA*

	1947	1948	1949	1950	1951
Income					
$b_{12.3}$	1.093	0.666	1.261	1.345	1.296
$S_{b12.3}$	0.442	0.344	0.361	0.281	0.306
$r_{12.3}$	0.430	0.349	0.544	0.659	0.605
Absolute Price within the State					
$b_{13.2}$	−255	−246	−181	−51	−64
$S_{b13.2}$	118	87	98	80	88
$r_{13.2}$	−0.384	−0.475	−0.326	−0.114	−0.130
Total					
$R_{1.23}$	0.608	0.603	0.634	0.676	0.670

* NOTE: The values given for $b_{12.3}$ for the various years suggest that for every one dollar of increase (or decrease) in per capita incomes of a certain state we would expect to find on the average an increase (or decrease) of the indicated amount in number of cigarettes purchased annually in the state per civilian age 15 and over in the state—other independent variables remaining unchanged.

Similarly, the values given for $b_{13.2}$ for the various years suggest that for every one cent increase (or decrease) in cigarette prices per pack of 20 cigarettes in a certain state we would on the average expect to observe a decrease (or increase) of the indicated amount in the number of cigarettes purchased annually in the state per civilian age 15 and over in the state—other independent variables remaining unchanged.

The S_b measures are the standard errors of the respective regression coefficients; and the r measures are the respective coefficients of partial correlation. R is the coefficient of multiple correlation.

mand curves of individual consumers from year to year, through introducing "time" as one of the independent variables. With the simple cross-section approach, however, it is not possible to "control" the net variations in cigarette purchases from state to state that may be due to

[11] Using a time-series approach, Tennant analyzed U. S. per capita consumption of all tobacco products as determined by annual real national income per capita and by time, for the period 1913 to 1945, securing an R^2 of 0.967. See Richard B. Tennant, *The American Cigarette Industry* (New Haven, Yale University Press, 1950), pp. 119-120.

Also using the time-series analysis of aggregate national data, the writer is presently analyzing per-capita (age 15 and over) Canadian cigarette consumption during the period 1920 through 1951 as determined by real income per capita, real cigarette prices, and time. An R^2 in excess of 0.95 has been indicated by preliminary techniques.

differences among the states in consumer preferences.[12] Second, there are larger errors in the state data as to the dependent variable, cigarette purchases (X_1), than in the national data. The volume of business from out-of-state transients and vacationists is relatively more important in some states than in others. Some of the more price-conscious citizens of high-tax states purchase cigarettes from low-tax or no-tax states to avoid the state cigarette taxes, but the extent of this practice is not necessarily uniform among high-tax states. Some states are more efficient and effective than others in the administration and enforcement of state cigarette taxes. Finally, there are large errors in the state data in respect to the independent variables. Probably the most important errors are in prices in the state markets (X_3), since prices in the various states have been assumed to differ only by the amount of differences in the states' respective cigarette taxes.

Another implication of the contrasting methodologies of the two approaches is the fact that both lead to estimates of the net influences of income (X_2) and price (X_3) on cigarette consumption that are averages of changing values. With the time-series analysis of national data, the estimates of the partial-regression coefficients for income ($b_{12.3}$) and price ($b_{13.2}$) are averages of the respective parameters in the different past years, if the values of the parameters have actually changed somewhat, as seems likely. With the geographic-cross-section analysis of state data, these estimates are averages of the respective parameters in each of the various states, if the value of these parameters were somewhat different for each state, as seems likely.

The two approaches, moreover, measure quantities that are conceptually different. In the case of the time-series analysis of national data, the partial-regression coefficient for price ($b_{13.2}$) indicates the net influence of price on cigarette "consumption," with cigarette "consumption" equaling cigarette "purchases." In the case of the cross-section analysis of state data, however, the partial-regression coefficient for cigarette price reflects the net influence of price on cigarette "purchases," with cigarette "purchases" *not* equaling cigarette "consumption" because of illegal interstate movement of cigarettes in evasion of state cigarette taxes. The measure

[12] It would be possible to attempt to eliminate states that are suspected of being unique in some relevant respect. As an obvious example, at the start the writer thought of Utah, a high percentage of whose population belongs to a religious group (the Mormons) that strongly opposes the use of tobacco. But in other states other religious groups are also somewhat opposed to tobacco. Not having external sources that indicate how effective these religious taboos against the use of tobacco actually are (either in general or for one group compared with another), and not knowing what importance to attach to other possibly unique characteristics of other states that could be mentioned, the investigator would hardly be justified in selectively eliminating those observations that diverge from a pattern to which he expected the data in his study to conform.

derived from the analysis of state data would—after the consideration of and allowance for other biases—be directly relevant to the decisions of state legislators and administrators of state taxes. If the measure derived from state data were to be used as the basis for an estimate of the net influence of retail price on cigarette consumption in the nation-wide market, however, some downward correction would be in order. Because of the possibility of a person's purchasing cigarettes in other states with lower cigarette taxes than his state of residence, one would expect the net influence of the retail price of cigarettes on the purchases of cigarettes to be quantitatively greater in the several state markets individually than in the nation-wide market.

A consideration, which operating in the cross-section analysis of state data might bias the value of the coefficient of partial regression of purchases on price as an estimate of the responsiveness of purchases to price in state-wide markets, is the frequency and recency of changes in the retail prices of cigarettes in the several states. Since cigarettes are a commodity without close substitutes, cigarette consumers probably respond in a short period more drastically to price changes than they do in a longer period. If this is so, analysis of data for a year in which a large number of states either increased, or had recently increased, their cigarette-tax rates would yield a partial regression coefficient of purchases on price that would overestimate the net influence of price in a longer period of time during which consumers "got over the shock" of the higher price.[13] Between 1947 and 1951, ten states previously not taxing cigarettes had adopted new cigarette taxes; and during this same period there were 27 instances of increases in state cigarette taxes, 19 of which occurred before 1950. Such a bias would be operative in these cross-section analyses of state data, especially for the earlier years in which imposition of new cigarette taxes and increases in cigarette-tax rates were more numerous. Since changes in the respective state cigarette taxes also affect the annual average retail price of cigarettes used in the time-series analysis of national data, however, this same kind of bias would also be operative to some extent in the time-series analysis of national data.

Finally, it must also be recognized that in such multiple-regression analyses as this, either omitted variables (sometimes called "disturbances") or errors in certain of the data analyzed may sometimes bias the partial-regression coefficients.[14] When variables of relatively minor importance are omitted from the regression equation, no systematic bias of the partial regression coefficients will result *if* the disturbances are un-

[13] This consideration was pointed out by Leon Rothenberg, Research Director of the Federation of Tax Administrators.

[14] Richard J. Foote and Karl A. Fox, *Analytical Tools for Measuring Demand*, U. S. Department of Agriculture, Agricultural Marketing Service, Agricultural Handbook No. 64 (Washington: Government Printing Office, 1954), pp. 29-35.

correlated with the variables included in the analysis. Failure to control the variation in consumer tastes from state to state constitutes the omission of a fairly important variable; and, of course, it is not known if this omitted variable is correlated with any of the included variables. However, correlation between this omitted variable and the included variables is not obvious. Errors in the data as to the *dependent* variable will not bias the partial regression coefficients *if* these errors are random. Random errors in the *independent* variables, however, will tend to bias their respective partial regression coefficients *toward zero*. Although it seems highly likely that errors are present in the data on differences among the states in retail cigarette prices, the identity of such individual errors is not known and the errors are probably distributed in a random fashion.

Cross-section Analysis of State Data, Considering Also the Prevalence of Evasion of State Cigarette Taxes

An attempt was made to analyze the state data, to discover the quantitative importance of the illegal inter-state movement of cigarettes by those smokers residing in high-tax states who secure a large proportion of their cigarettes from low-tax or no-tax states by purchasing several cartons for future use whenever they (or friends acting for them) are in lower-taxed states.[15] Up to this point the cross-section analysis of state data considered retail cigarette prices in terms of the absolute level of cigarette prices within each state without reference to the levels of cigarette prices in surrounding states.

An additional independent variable was devised to measure the *relationship* between retail cigarette prices within a state and those in adjoining states. This "Index of Cigarette Prices Within a State Relative to Prices in Adjoining States" (X_6) was defined so as to take into consideration the following factors: a state's density of population, its cigarette-tax rate, the length of its total boundary, adjoining states' cigarette-tax rates, their respective average population densities, and the respective lengths of their boundaries with the state whose index is being computed. The mathematical definition of this index is as follows:

$$\frac{\sum \left(\begin{array}{c}\text{Number of miles of}\\ \text{base state's bound-}\\ \text{ary touching adjoin-}\\ \text{ing state "i"}\end{array}\right) \cdot \left(\begin{array}{c}\text{Tax rate of adjoin-}\\ \text{ing state "i" less}\\ \text{tax rate of the base}\\ \text{state}\end{array}\right) \cdot \left(\begin{array}{c}\text{Population density}\\ \text{of the higher taxed}\\ \text{of the two states,}\\ \text{i.e., of the base state}\\ \text{or of state "i"}\end{array}\right)}{\left(\begin{array}{c}\text{Total number of miles of}\\ \text{base state's boundary}\end{array}\right) \cdot \left(\begin{array}{c}\text{Base state's population}\\ \text{density per square mile}\end{array}\right)}$$

In this formula the state whose index is being computed is referred to as the "base" state and the various adjoining states are represented in turn as state "i." In each of the products summed in the numerator, a plus or a

[15] "Cigarette Smugglers," *Newsweek*, 33 (July 27, 1949), pp. 20-27.

minus sign appears if the tax rate of the adjoining state "i" is respectively higher than or lower than the tax rate of the base state. The sign of the whole index is plus or minus, depending on the sign of the summed signed products. Thus if a state is largely surrounded by states with higher cigarette taxes, that state will have a positive (+) index value. Such a state might be expected to "gain" cigarette sales at the expense of adjoining states, since consumers in the adjoining higher-taxed states would secure a portion of their cigarettes from this lower-tax state.

TABLE B. RESULTS OF FITTING THE EQUATION $X_1=a_{1.236}+b_{12.36}X_2+b_{13.26}X_3+b_{16.23}X_6$ TO ANNUAL STATE DATA*

	1947	1950	1951
Income			
$b_{12.36}$	1.194	1.410	1.321
$S_{b12.36}$	0.449	0.276	0.300
$r_{12.36}$	0.463	0.688	0.626
Absolute Price within the State			
$b_{13.26}$	−124	44	36
$S_{b13.26}$	166	98	108
$r_{13.26}$	−0.146	0.084	.061
Index of Internal Price Relative to Price in Adjoining States			
$b_{16.23}$	163	161	158
$S_{b16.23}$	146	101	103
$r_{16.23}$	0.215	.285	.271
Total			
$R_{1.236}$	0.632	0.707	0.700

* NOTE: The values given for $b_{16.2}$ for the various years suggest that for every 1.0 increase (or decrease) in the value of the index of internal price relative to prices in adjoining states we would on the average expect to find an increase (or decrease) of the indicated amount in the number of cigarettes purchased annually in the state per civilian age 15 and over—other independent variables remaining unchanged.

Other measures are as defined in the note to Table A.

An obvious inadequacy of this index is the fact that it considers only the average population densities of the several states rather than the population densities of the contiguous areas of the neighboring states. Thus if a large part of the population of a high-tax state were resident in metropolitan areas on the border with lower-tax states, this state would be more likely to "lose" cigarette sales to adjoining states than if the state's population were evenly distributed or if its metropolitan areas were distant from surrounding low-tax states. The index makes no such subtle distinctions, because of the much heavier computing load that would be involved in calculating the several states' index values for a more sensitive index.

The values of this Index of Cigarette Price Within a State Relative to Prices in Adjoining States (X_6) were computed for each of the states in the study for the years 1947, 1950, and 1951. When this variable was added to the regression equation, the results shown in Table B were ob-

tained by the new linear multiple-regression equation. Although adding X_6 to the other two independent variables in the regression results in sensible signs for the $b_{16.23}$ partial-regression coefficients, the $R_{1.236}$ coefficients of multiple correlation are increased only slightly over the $R_{1.23}$ values, and the signs of the $b_{13.26}$ partial-regression coefficients are not sensible in two of the three years. Substituting the X_6 variable for the X_3 variable in the multiple regression equation yielded the results shown in Table C. Although the $R_{1.26}$ coefficients of multiple correlation are

TABLE C. RESULTS OF FITTING THE EQUATION $X_1=a_{1.26}+b_{12.6}X_2+b_{16.2}X_6$ TO ANNUAL STATE DATA*

	1947	1950	1951
Income			
$b_{12.6}$	1.317	1.382	1.284
$S_{b12.6}$	.414	.266	.276
$r_{12.6}$	0.522	0.688	0.641
Index of Internal Price Relative to Prices in Adjoining States			
$b_{16.2}$	240	134	137
$S_{b16.2}$	102	79	81
$r_{16.2}$	0.411	0.295	0.293
Total			
$R_{1.26}$	0.621	0.705	.698

* NOTE: The several statistical measures are defined in the notes to Tables A and B.

slightly larger than those of $R_{1.23}$ and the signs of the $b_{12.6}$ and $b_{16.2}$ partial regression coefficients are all sensible, the values of the $b_{16.2}$ coefficients are less than twice their standard errors in two of the three years.

Adding X_6 to the other two independent variables in the regression or substituting it for X_3 does not cause greater changes in the results, probably because there are inadequacies in the definition and measurement of X_6 and because there is considerable simple correlation between the absolute internal price (X_3) and the index of internal price relative to external price (X_6). For the years 1947, 1950, and 1951 these simple correlation coefficients were respectively -0.60, -0.59, and -0.63. The fact that $r_{16.2}$ exceeds $r_{13.2}$ in each of the three years suggests that a state's cigarette tax being higher or lower than neighboring states' cigarette taxes may be a relatively important determinant of cigarette purchases within that state, and that price elasticity of rate of sales of cigarettes within individual state-wide market areas (whether or not consumed by residents) is probably greater than price elasticity of demand within the nation-wide market area.

Interpretation of the Statistical Results

The unavoidable omission of such an important variable from this analysis as differences among the states in consumers' tastes is grounds for considerable caution and skepticism in appraising the results. Although the usual tests of statistical significance have been employed in evaluating the results, it should be emphasized that—strictly speaking—these tests are applicable only to situations of sampling variability under highly restrictive conditions. In the present analysis, however, omitted variables may constitute a more serious difficulty than sampling variability. Therefore, in such an investigation as this the reliability of a value with a "high level of statistical significance" should still be open to question. Where the results of this analysis are in substantial agreement with those of other analyses employing a different approach and different data, however, it would seem that the results of this analysis constitute additional—if only circumstantial—evidence as to the actual dimensions of income elasticity of demand for cigarettes (and, perhaps, even of price elasticity of demand) in the present-day United States under prosperous economic conditions.

The coefficients of partial regression of cigarette purchases on per-capita incomes, which were yielded by the cross-section analyses of state data for the years 1947 through 1951 (and are reported in Table A above), are statistically significant at the five percent level and all except the 1948 value are significant at the one percent level.[16] These partial regression values imply the following coefficients of income elasticity of demand for cigarettes, at the mean income-per-capita: + 0.46 (1947); +0.29 (1948); + 0.52 (1949); + 0.59 (1950); and + 0.60 (1951). Since these are in general agreement with the results of the 1948 Treasury Department study and George Rockwell's unpublished analysis, the income elasticity of demand for cigarettes during periods of high incomes and little unemployment appears to be somewhere around + 0.5.

The coefficients of partial regression of cigarette purchases (or sales) on retail cigarette prices yielded by this cross-section analysis (reported in Table A above) are statistically significant at the 5-percent level only for the years 1947 through 1949, the values for 1950 and 1951 being clearly nonsignificant.[17] These partial regression coefficients imply the following coefficients of price elasticity of sales of cigarettes in state-wide markets at the mean prices: −1.48 (1947); −1.44 (1948); −1.08 (1949);

[16] Since we know *a priori* that the coefficient of partial regression of cigarette purchases on income per capita should be positive, a one-tailed "t" test is appropriate.

[17] Similarly, here on theoretical grounds we expect the coefficient of partial regression of cigarette purchases on retail price to be negative, a one-tailed "t" test therefore being applicable.

−0.31 (1950); and −0.38 (1951). The large magnitudes indicated for price elasticity of sales in state markets in the years 1947 through 1949 may be due in large part to the following considerations: (1) the greater frequency of imposition of new state cigarette taxes and increases in existing state cigarette taxes during the years 1947 through 1949; and (2) the greater importance of inter-state mail-order cigarette traffic in evasion of state cigarette taxes, before the enactment of the Jenkins Act in 1949.[18] If this interpretation is correct, only the figures for the years 1950 and 1951 would be relevant to the question of the price elasticity of the rate of sales of cigarettes in state-wide markets during a future period of reasonably full employment. The coefficients of partial regression of cigarette purchases on retail cigarette prices for these two years are non-significant by the usual statistical tests, although these values are quite consistent with the results of the two recent time-series analyses of demand for cigarettes.

Since such a geographic-cross-section analysis of state data as this is somewhat different from the techniques of demand analysis usually employed, a brief discussion of the problems of interpreting the coefficient of partial regression of cigarette sales on retail cigarette prices may be of interest. If the 1950 and 1951 values of this coefficient had been statistically significant and deserving of more confidence, the partial regression coefficients would have involved to some extent the operation of at least two biases: (1) increases in the taxes of several states during each of these years (although fewer than in each of the three previous years) probably bias the partial regression coefficients for price away from zero; and (2) errors in the data for retail cigarette prices, if random, bias the partial-regression coefficients for price toward zero. The statistical analysis itself does not indicate which of these biases would be likely to dominate the other. If the results of this type of geographic-cross-section analysis of state data were also to be used as a basis for estimates of the responsiveness of cigarette consumption to price changes in the nation-wide market, it would be necessary to recognize that in state-wide markets the price responsiveness of cigarette sales is, because of inter-state movement of cigarettes in evasion of state cigarette taxes, probably greater than the price responsiveness of cigarette consumption in the nation-wide market. As an estimate of the responsiveness of cigarette consumption to price changes in the national market, therefore, the value of the coefficient of partial regression of cigarette sales on retail prices in state markets would necessarily have to be adjusted toward zero—i.e., its absolute value somewhat reduced.

[18] Under the Jenkins Act mail-order vendors of cigarettes to out-of-state customers are required to report to the respective state authorities the names and addresses of residents who have secured cigarettes in this manner and the quantities so purchased.

RURAL MERCHANDISING IN THE ALABAMA BLACK BELT, 1875-1917

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THE country store and furnishing business, as one of the key economic factors in the era of tenancy following the Civil War, has received some attention in Southern historical literature.[1] Important insights about the Southern economy can be gained from such historical surveys. The present article is based primarily on several country store records of a ten county area not heretofore used.

The Black Belt of Alabama is a strip of prairie soil twenty-five miles and less in width that curves across the state and on into Mississippi.[2] The characteristic black soil is formed by the mixing of the soft limestone base rock with the humus of the surface.[3] Black Belters like to think that the culture in the vicinity of the prairie is superior to that in the sandy lands due to the background of "wealth and culture" which presumably existed there prior to the Civil War. Although Negroes far out-number the white people in the Black Belt, their preponderance does not constitute a basis for definition, since there are other sections of Alabama that also have heavy Negro population. The summers of the Black Belt are hot and long.

Although it was not invaded until late in the Civil War, the Union armies that appeared there in 1865 and the general war-time drain on its resources left the region in somewhat the same condition as many other sections of the South. Consequently, the results of the war, the burdens of Reconstruction, and the effects of the depression of 1873 left the Black Belt in a very impoverished condition at the time our study opens in 1875.

Tenure System

One of the most significant social features of the Black Belt life was the tenant and credit system. Most farms were operated by tenants who

[1] Notably T. D. Clark, *Pills, Petticoats, and Plows,* Indianapolis 7, Indiana: Bobbs-Merrill Company, 1944; J. P. Bull, "The General Merchant in the Economic History of the New South," *Journal of Southern History,* XVIII, no. 1 (February, 1952), 37-59.

[2] The Belt is bordered on the north and south by the towns of Montgomery, Selma, Linden, Marion, Greensboro, Eutaw, Livingston, Camden, and Union Springs.

[3] The counties selected here for study are Sumter, Greene, Hale, Perry, Marengo, Dallas, Wilcox, Lowndes, Montgomery, and Bullock, through which the black soil belt runs. They include also other sandy and hillside lands. This is the usage of J. D. Pope, whose conception has become most generally used in scientific works and government reports. J. D. Pope, "Types of Farming Areas," Alabama State Department of Agriculture and Industries, *Agriculture of Alabama,* Montgomery: Birmingham Printing Company, 1930, p. 53ff.

regularly obtained advances from local merchants to carry them through their crop year. It was a system not exactly unique to the Black Belt, since it was common throughout the South.

As a prevailing situation, the plantations of the region were divided into tenant tracts that were cultivated by a single Negro family with one or a few mules. Although credit advances were often arranged by the planter, the man who furnished the provisions was the local advancing merchant who ran the country or small town store in the neighborhood. The legal basis for this system was the crop lien laws, which allowed the tenant to offer as security on loans a claim against his forthcoming crops. The liens were supposed to be recorded in the county probate offices, but presumably many were handled informally and never recorded.[4] In general, by 1880 the large plantations of the ante-bellum period had been divided into smaller tracts either for tenancy or for ownership, and tenant tracts became the most characteristic farm unit of the region.[5]

The wage system never became as popular as tenancy, and several variations of the tenant system came into practice. The tenant might look to his landlord for advances necessary to keep him going from one harvest to the next. He might rent from one man and depend on another, the merchant, for his advances. A very common practice was for the landlord to make arrangements at a store for "advancing" all his tenants. Then he would write notes to the merchant for his tenants asking the merchant to let the tenants have certain articles and to charge them to the landlord. At the beginning of each season the tenant made a crop lien to his landlord or advancing merchant which bound him to pay back the amount advanced to him. Tenants who farmed for a share of the crop were much more numerous in the eighties than tenants who paid money rent. It was then almost the universal practice on the large farms for the landlord to furnish all necessary supplies except the laborers' board and to receive one-half of all the crops. When only the land was furnished by the owner, he usually received one-fourth of the cotton and one-third of the corn produced by the tenant. If the tenant rented his land from a landlord and received his advances from a merchant who was a different person, he paid a portion of his crop as rent to the landlord and a portion to the merchant for the advances.[6]

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[4] State of Alabama, *Revised Code of Alabama, 1867*, Montgomery, 1867, p. 410; *Code of Alabama, 1876*, p. 783; *Code of Alabama, 1897*, pp. 793-798.

[5] Evidence for this is found in the United States manuscript censuses of agriculture, 1860-1870-1880. Copies of these are found in the State Department of Archives, Montgomery, Alabama.

[6] The most original sources for information of this sort were the country store records cited hereafter, the indexes to chattel mortgages found in the probate offices of all the county court houses, and the first hand testimony of certain individuals, like Judge Irby Pope (since deceased) of Perry County, J. A. Minter of Tyler, Dallas

The standard advance was forty dollars for each mule employed. Annual advances to a single tenant usually ranged from about forty dollars to $800, but the most likely amount was around $250. It was considered practically a crime for the landlord to pay more than the standard amount for his labor, and he dared not draw labor from another landlord without guaranteeing all the tenant owed.

There was an almost universal outcry on the part of whites who were farming with Negro tenants. Most of the dissatisfaction of these white planters was directed toward the troubles of the white owner rather than the pitiful plight of the tenant. It was commonly reported that this system of cotton culture damaged the quality of the cotton and wore out the land. It was felt that the Negro was responsible for his low standard of living because of his lazy habits, and that the white man suffered also because he must deal with such a good-for-nothing creature.

The merchant rather than the planter was the person upon whom the less fortunate portions of the population came most to depend for financial aid in making crops. Since the Black Belt was primarily an agricultural section, the merchant became a sort of agrarian financier. The few banks in the Black Belt after the Civil War could not or would not undertake this vast amount of small scale financial backing of Negro and white farmers, who had to have someone to depend on for support from one planting season to the next. The man who rendered this service and reaped the liberal profits or the stunning disasters of the enterprise became known as the "advancing merchant." His influence in fixing the type of southern economy was great, since he insisted on the one crop, cotton, which was most certain to net him a cash return.

These men left their mark on the mortgage books of the county courthouses. There were countless numbers of them, locating their establishments at every crossroads, village, and town. They came and went over the period of a generation, frequently dealing both in partnerships and as individuals. Some of these institutions were more permanent than others, and some were well known throughout the state. The immense amount of advancing business that these merchants did is evidenced by page after page in the indexes to crop liens and chattel mortgages, found in the offices of the country judges of probate.

The process of advancing began each year when the tenant had used up whatever he had made on the previous summer's crop or when he was preparing to plant a crop in the spring. He went to his landlord or merchant, to whom he gave a contract and mortgage. The tenant received the privilege of drawing on the advancer up to the amount of the mort-

County, John A. Rogers, Jr., of Gainesville, Sumter County, Allen and Lon Grubbs of Livingston and Eutaw, respectively, and others who were intimately connected with the business.

gage, and frequently the mortgage was worded to cover any advances over and beyond those specifically stated in the mortgage. The tenant generally pledged "the entire crop of corn, cotton, cotton seed, fodder, peas and potatoes, which may be made and grown on the plantation . . . , or any other place which I . . . (my) family and my hands are cultivating during the present year";[7] and also any livestock on the place. Full legal title to and control of the crops were vested in the advancer from the time of planting, and he might claim and sell the mortgaged property at any time he felt that his interests were jeopardized.

The advancing merchant was a speculator, gambling a whole year's provisions upon the chance of a possible crop. The innumerable possibilities of loss incident to crop failures, removal of tenants, and expenses of supervision were reckoned into the charges he made. Sometimes this charge was made informally by simply increasing the prices of the daily purchases. Interest on some large accounts was computed in December, but the usual custom was to settle at cotton marketing time.

The rate of interest was not uniform, although in general it was high. In Dallas County an interest charge ranging from eight to fifteen per cent was often added to a large profit on the merchandise advanced.[8] Charges made by A. G. Tuttle, a general merchant of Shorters, Alabama, varied between ten and twenty-five per cent.[9] One advancing merchant stated that he and his father before him charged advancing prices on merchandise that were double the prices they paid for the same goods to Mobile commission merchants. The amount of interest charged depended upon the honesty of the advancing merchant, his competition, and the customs of the area. The excessive charges of the early period were later replaced by a fixed eight or ten per cent interest charge on most advanced accounts.

The merchant bought his merchandise on credit from the wholesale supply houses. Wholesale commission merchants in Selma charged one dollar to $1.50 on each ten dollars worth of merchandise advanced by them, unless a bale of cotton was delivered to them for each ten dollars advanced; then a commission of 2½ per cent was charged for selling the cotton.[10] About 1892, after the Marion Central Bank began to make advances on chattel mortagages and crop liens, it became customary for landowners in Perry County to take a mortgage from each tenant or sharecropper on the rented lands, go to the bank, and execute a blanket

[7] Lowndes County, Mortgage Record, Vol. 3-U, mortgage of February 8, 1886. This is only one of innumerable similar instruments to be found in the chattel mortgage records of all the counties studied.

[8] J. A. Minter, Tyler, Dallas County, Alabama.

[9] A. G. Tuttle, Store Accounts, Shorter's Depot, Alabama (10 vols., 1879-1889, 1896-1897, Alabama State Department of Archives), July 4, Nov. 3, 1879, June 5-Sept. 27, 1880.

[10] Irby Pope.

mortgage on all their property, offering their tenants' mortgages as partial security for their own.[11]

The upheaval in Black Belt cotton farming due to the boll weevil and other factors between 1910 and 1920 dealt severe blows to the advancing business. Although advancing merchants had reckoned with the ordinary uncertainties of farming, they could not cope profitably with the boll weevil and the other factors of that period which made advancing credit toward an unproduced cotton crop too great a gamble. They therefore became more cautious in extending credit.[12] The tenants, unable to secure the necessary advances, could not plant their crops. Lack of credit thus became an additional factor in the decline of the cotton industry.

The records of mortgages in the county courthouses tell the story of the decline of the advancing business. Although it is doubtless true that many of the credit arrangements were simply informal agreements between the advancer and the farmer, still a sufficiently large number of them were legally recorded to indicate the trend of the times. One observes that from 1900 to 1914 the number of mortgages on personal property, such as mules and cattle, and on crops continued with little change except in Montgomery County. There was far less advancing business in that county than in the others, probably because it came early to devote more of its land to a diversified type of agriculture and to cattle raising rather than to cotton. It was after 1915, when weevil infestation had reached a highly damaging peak, that the number of cotton advances dropped sharply in most of the counties.

Merchants and Trading Practices

The decline of the advancing merchants of Dallas County, which took place between 1916 and 1930, carried with it the decline of many prosperous rural communities. Before 1916 there were many small villages centered about one or more country stores and cotton gins.[13] The retail stores, which were the centers of the communities, flourished in the heyday of the advancing business. Gradually the businesses declined, and the once thriving communities decreased in importance so that they became little more than named localities. The farmers of the section, who once depended on the country stores for their supplies, now traded only at stores in Selma.[14]

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[11] *Ibid.;* Perry County, Alabama, Deed Record, Vol. 40, pp. 102-105 (mortgage from a plantation owner to a bank), Dec. 10, 1888.

[12] *Geiger Times,* Oct. 21, 1915.

[13] Among these villages were Tilden, Pineapple, Furman, Pleasant Hill, Minter Station, Collirene, Portland, Saffold, Martin's Station, Tyler, and Orrville.

[14] Only four of the large advancing merchants remained in 1930: J. B. Hain, Sardis and Selma; J. H. Dunaway, Orrville; E. M. Marshall and Son, Orrville; and J. A. Minter, Tyler. In 1942 only J. B. Hain and J. A. Minter were left, and the latter, by his own statement, was working only fifty per cent of his cotton acreage of ten years

The chief institution through which the advancing of tenants was conducted was the general merchandise store. There had been stores in the South before the Civil War, but the widespread growth of the country store in connection with the cotton credit business of tenants was a post-war development. Local needs restricted by poor roads and ineffective means of communication brought these stores into existence throughout the rural South.[15]

The successful merchant of a Black Belt farm community between 1870 and 1915 was of necessity a businessman of a high degree of competence. Not only did he have to keep a watchful eye on the quantity and the quality of his stock of goods in its relationship to the local demand, but he also had to serve as banker and credit agent. Since his business relied on credit—both in obtaining it from wholesale houses and in extending it to his customers—and credit was dependent on the cotton crop, he had to understand the hazards of the production of the staple and the profitable means of marketing it.

Cash business was a small matter. The firm of Olive and Pinkston in Shorters had cash sales in the month of June, 1874 of only $21.35, while during the same month the credit business amounted to $1,191.46.[16] Credit was extended for months, until the next harvest season, and only a few customers paid their bills monthly.[17] Settlement time came in the fall when cotton was sold, and at this season the livelihoods of the planter, the tenant, and the merchant were at stake. The customer who had obtained advances from the merchant was obligated to consign his cotton to the merchant to pay for his supplies of the past year. The merchant, in turn, sold the cotton at whatever profit he could to local cotton buyers or wholesale merchants in the cities. Sometimes the cotton credit arrangement was made directly with Negro tenants. In other cases the planter secured credit from the merchant, with the future crop as security, and purchases made by the tenant were charged to the planter. Such purchases were called "orders." The storekeeper noted the name of the tenant who made the purchases, together with the name of the landowner to whom the cost was charged.[18]

The "banking functions" of the country storekeeper included advancing small sums of money for special purposes such as medical attention, rent,

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before and ginning 1500 instead of the 2500 bales of twelve years before. Interview with J. A. Minter, Tyler, Dallas County, Alabama.

[15] T. D. Clark, *Pills, Petticoats, and Plows*, p. 57.

[16] Journal, Olive and Pinkston, Dec. 2, 1872-Aug. 21, 1886 (Alabama State Department of Archives), p. 183.

[17] *Ibid.*; see also the books of T. E. Lockard and Spratt and Gowdey, Livingston (Alabama State Department of Archives).

[18] Note the stores of T. E. Lockard, P. F. Osborn, M. F. Jackson, and an anonymous ledger from Eutaw in the Alabama State Department of Archives.

circus tickets, postage, Sunday School contributions, marriage licenses, taxes, and ready cash.[19]

Diets, Supplies, and Levels of Living

The food supplies of these stores reveal a wearisome monotony in the diet of the people. The staples were flour, corn meal, salt pork or "sidemeat," sugar, lard, salt, and coffee. They were bought the year around in large quantities, without regard to the season. Both rich and poor depended on these same groceries for their basic diet, although the wealthier customers could indulge more freely in the luxury items that occasionally came to the store, such as salt mackerel, pickles, apples, and oranges. There was always some demand for grits, rice, and soda crackers, and frequently the customers indulged in pork shoulder or ham. Cheese was a great favorite, and frequently it was sold with crackers to a visiting farmer for his midday lunch. Canned salmon or sardines were also popular delicacies for lunches.[20]

There was little else in the grocery line. Fresh vegetables were not listed in any of the country store records studied, except for an occasional mention of potatoes. In the 1880's a few canned peaches and tomatoes appeared, but through 1910 very few canned vegetables or fruits were sold. The word "meat" was synonymous with salt pork, and meat sales were almost entirely limited to that commodity. Occasionally beef was available, brought to the store by a local farmer. The large quantities of soda sold, usually by the pound, were evidence of the popularity of soda biscuits and corn bread. Around 1900, however, baking powder became more popular. Molasses, the natural topping for soda biscuits, was losing ground to sugar. There was little other change in the kinds of groceries sold between the 1880's and 1910.

Country produce like chickens, butter, or eggs, usually an important means of barter in country stores, was not handled extensively in Black Belt country stores. In the fall the general store sold turnip and rutabaga seed and in the spring garden seed, but not the vegetables themselves.

Tobacco in various forms was in great demand. Hardly a single large purchase was made without it. Cigars were a luxury for the well-to-do, and cigarettes were bought but rarely. Most of the general stores, although not all of them, sold whiskey. It was sold by the jug or by the bottle in small amounts, the latter usually to Negroes.[21]

The clothing trade was an important one in the Black Belt stores from 1870 to 1910. Men's suits were stocked, but more frequently a coat and

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[19] See the store books of A. G. Tuttle and those cited above.
[20] These facts and others following are illustrated from the books just cited.
[21] These conclusions are drawn from the country store records cited herein.

vest were sold to be worn with pants either bought ready-made or made at home. For homemade pants countless yards of jeans and osnaburgs were sold; and, while ready-made underwear was available, the small number of the purchases indicated that much of this was also homemade. After 1900 the osnaburg and jeans trade declined as men bought more ready-made pants. In the nineties there was a noticeable increase in the sale of men's underwear, especially during fall and winter months, and this trend continued. Brogans and other types of shoes had a steady demand, as well as overshoes and boots. Yet men's socks were scarcely sold at all. Nor did the men buy many shirts before 1900, although collars and cuffs were common purchases. In those days men depended for much of their clothing on the arts of the sewing machine and the knitting needle.

Almost all women's clothes were made at home or by dressmakers. The usual order for a dress was ten yards of cloth, together with two or three dozen buttons, hooks and eyes, and thread. For $8.63 a woman might, in 1878, purchase the necessary materials to make a "good" dress of cashmere, and for only one dollar she could make a calico dress trimmed with two yards of ribbon. A popular item in the seventies was the sundown, a broad-brimmed hat. For the adornment of the ladies there were also hoop skirts (in the seventies), shoes, hose, scarfs, gloves, and parasols; and to mold them to the mode of the times, there were corsets and a supply of extra strings.

Calico was a popular material for house dresses throughout the forty year period. There was, however, variety in the dry goods for sale, for as early as 1870 one could purchase cambric, domestic, linen, poplin, and silk. In later years there were still others to choose from—cottonade, lawn, dotted Swiss, and seersucker.

The country store was a source of supply for all common household necessities. The customers bought quantities of kerosene oil for their lamps, as well as many lamp chimneys. Candles were sold by the pound. In the seventies "store bought" soap was a luxury. Potash for soap making was in demand, for the farmer's household depended on strong homemade soap and vigorous scrubbing to keep them as clean as need be. In the middle eighties, and later, bars of soap were in greater demand. The most popular cooking utensil was the skillet. Occasionally a Negro bought a "spider[22] and oven" for fireplace cooking. Bedding included not only mattresses and blankets, but also mosquito netting and frames—the latter common after 1900. Other necessities included lanterns, churns, chambers or "thunder mugs," well buckets, spittoons, and the pride of the bedroom —the bowl and pitcher. The country store could furnish a stove or a sew-

[22] A flat skillet with legs for cooking over a fireplace. The oven was set on the spider.

ing machine. At least one general store, P. F. Osborne of Greensboro, in 1909 and 1910 conducted a thriving trade in furniture. The sales included beds and dressers, wash stands, "sitting chairs," and rocking chairs.

The patent medicine trade was apparently less important in Black Belt general stores than in similar stores in other parts of the South. Although the ready-print pages of the local newspapers urged the readers to partake of numerous cure-alls, the customers of the stores examined bought few of these remedies. The common household antiseptic was turpentine. In September and October quinine was required to combat malaria.[23] The inventory of Pinkston and Brothers in August, 1884 listed only a meager supply of patent medicines, among them: "1 box Tuts, 2 pain killer, 2 August Flower." They were more plentifully supplied with camphor, laudanum, paregoric, and morphine.[24]

Farmers looked to the general store for their farming equipment, their seed and fertilizers, and feed for their stock. Plows and plow points were usually bought in February. From February through April there was a flourishing trade in cotton seed, sold by the bushel. Seed corn was also sold, but there was little demand for vegetable seeds. In the seventies fertilizer was a minor item, but in the eighties and afterward it was sold by the sack or the ton. In succeeding years the sales of phosphates and "blood and bone" became larger and more numerous.

A major expense for farmers was feed for the mules and horses. Very few farmers raised enough corn to last a full year, so that in June and July they were forced to buy corn, hay, and oats from the general store. When cotton picking time came, the farmer again turned to the store for bagging and ties for his cotton bales.

Accounts of Some Customers

The monthly accounts of a regular customer at a general store, traced over a period of several months, reveal much about his way of life. Such a customer was E. S. McWhorter of Shorter's station, a Black Belt landowner who traded at the general store of Olive and Pinkston. He bought flour by the barrel and pork shoulder or sides from twenty to fifty pounds at a time. These were bought the year around, as were meal, sugar, and coffee. Times were hard in 1874, and only necessities were bought. The only luxury items were a dozen fish and a can of lobster in November, a gallon of whiskey at Christmas time, and ten yards of velvet. When his supply of home grown corn was exhausted, he had to buy over 800 pounds

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[23] Journal, Olive and Pinkston, accounts for 1872-1875; T. E. Lockard, Ledger, accounts for 1878-1881; A. G. Tuttle Store accounts, July 4-November 3, 1879, pp. 6, 16, 30, 39, 41, 48, 51, 67ff, 191, June 5-September 27, 1880, pp. 41, 91, 211, 292, September 27, 1880-December 10, 1881, p. 7.

[24] Journal, Olive and Pinkston, p. 308ff.

of corn for his stock in May, June, and July. For clothing he bought osnaburgs, jeans, and calico, and in May, three pairs of shoes for two dollars each. Mr. McWhorter followed the custom of writing notes for orders of merchandise to be sold to his tenants and charged to his account. These were usually small amounts and were considered advances.[25]

Another customer at the same store was Loyd Jones, a Negro farm hand who obtained advances from Olive and Pinkston. He had a wife and two children, all farm hands, and one younger child. None of them could read or write.[26] Their principal food was corn meal, a bushel and a half a month. They also used between twenty and thirty pounds of bulk side meat. These, with salt and a little flour, were his only food purchases. In May the corn to feed his stock cost almost as much as the food for his family. A quarter's worth of tobacco, a bottle of oil, a bottle of turpentine, and $11.20 for cotton bagging and ties completed his purchases between May and September, 1874, which totaled $63.96. In October he brought two bales of cotton to the store and was credited with $132.46.[27]

In the more prosperous times of 1880 another Negro tenant, Dred Arrington of Sumter County, lived more sumptuously. His staff of life was flour, which he bought monthly. His family ate regularly of "side meat," and once during the year they had a ham. They bought sugar, molasses, and small amounts of coffee regularly, and once a bucket of lard. In May he indulged in a bottle of pickles, a can of salmon in June, and in October a box of sardines. He used tobacco freely. His family were clothed in homemade garments of alpaca, jeans, cottonade, calico, and osnaburg. He also bought shoes, shirts, a coat, and a vest. In November his seven bales of cotton sold for $387.07. Since his total bill at the store was $311.75 and his rent was the proceeds of two bales of cotton, or $97.50, he could face the new year only slightly in debt.[28]

Captain W. A. C. Jones of Livingston was a prosperous planter who provided bountifully for his family.[29] Although his purchases at the general store of T. E. Lockard were probably only a part of his supplies, they indicate the kind of provisions he used. He bought coffee ten pounds at a time, sugar twenty pounds or more at an order, flour by the barrel, and meal by the bushel. He frequently bought cheese and occasionally rice. During the year he bought several pairs of shoes, a few pairs of pants, and a coat and vest. The ladies of the family bought lavishly such fine dress

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[25] Journal, Olive and Pinkston, monthly accounts of E. S. McWhorter, May, 1874-April, 1875.

[26] *U. S. Manuscript census, Population, 1870, Macon County, Alabama*, p. 42

[27] Journal, Olive and Pinkston, accounts of Loyd Jones, May, 1874-May, 1875.

[28] T. E. Lockard, Ledger, monthly accounts of Dred Arrington, January-December, 1880.

[29] Interview with his daughter, Miss Hettie Jones, Livingston, Alabama.

materials as silk, lawn, brocade, cashmere, muslin, satin, and lace. Yet the account of Captain Jones during the year 1880 never exceeded sixty-three dollars per month.[30]

The Black Belt Today

In the years since the decline of the country store the economy of the Black Belt has undergone a complete transformation. Most of the plantations, where the tenants who patronized the country stores once lived, have been changed into ranches for raising cattle. This new business was made possible by the lush grasses of the prairie land. The change from cotton to cattle was given impetus by the boll weevil menace, war time demands for food, and declining cotton values.

The cut-rate cash groceries are to a large extent getting the business of the old credit establishments. A new economic era has arrived, as the Black Belt has changed from cotton and credit to cattle and cash.

[30] T. E. Lockard, Journal, January, 1880-December, 1880.

A MODIFIED COMPENSATORY PRICE PROGRAM FOR AGRICULTURE*

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FARM prices affect producers' incomes and influence production and consumption. Farm price policy has been in large measure a tug of war between the desire to use prices to improve farmers' incomes and the necessity of recognizing the allocative powers of price. This necessity is argued formally by numerous economists and, perhaps more effectively, by the realities of the market. The conflict between income objectives and resource allocation objectives has been so clear that it is common among economists to say that price may be used for either but not for both.

Despite this, we as a nation continue to try to devise a price program that supports farm income and handles production and consumption problems well enough to be administratively feasible and politically acceptable. The emphasis on the incompatibility of income support and resource allocation as objectives of price policy may have diverted economists' attention from possibilities of achieving the compromise that is so widely sought. This paper investigates one such possibility.

A basic assumption of the paper, believed to be generally supported by theory and research on the behavior of supply in agriculture, is that the importance of prices in allocating resources depends mainly upon their significance for marginal revenue rather than upon their relation to the absolute level of total income. That is, the inducement for a farmer to cut down on one enterprise and to substitute or expand another, or to increase or decrease total output, depends on the changes in income expected to result much more than on the level of income. This is hardly a startling conclusion, but it has been given very little recognition in actual or proposed price programs. Uusually it is assumed that if price is to be used to support farm income, the farmer must be paid a price that overvalues his marginal production. Or, the other way round, it has been assumed that if price is to guide farmers in making adjustments along the margin, then the whole of their income must be determined by the value of the marginal product.

The result has been farm programs that call for support of prices at above equilibrium levels, that overvalue farmers' marginal production, and that necessitate controls on production, diversion to storage, and subsidies for expansion of markets to make them work. Moreover, it is not clear that they do work except in times of persistent inflation. An alternative program would have to be cumbersome indeed to cause more direct and indirect complications than are now before us.

* Journal Series paper 1994, Pennsylvania Agricultural Experiment Station.

Even in the pricing of fluid milk, where the classified price plan is an explicit recognition of the marginal principle as applied to the demand side of the market, producers customarily are paid a blend price that overvalues the marginal output of each. It is hardly surprising that milk markets get "too much milk" when demand and prices of inputs are fairly stable.[1]

Compensatory price payments have been proposed in lieu of supported market prices. Farmers would be paid the difference between actual market prices and prices the government deemed fair or desirable. Production would not be controlled. But since the *intended price* (the market price plus the direct payment) would guide farmers in making marginal adjustments of output, intended prices that added very much to farm income might well induce wasteful expansion of output and require Treasury payments greatly in excess of those originally contemplated. For example, a rough computation suggests that had Secretary Brannan's plan become effective January 1, 1954, 4 billion dollars would have been required in that year for producer payments on the six perishable commodities among his ten priority products. The storage and production control programs for wheat, cotton, corn and tobacco would have been about as difficult as they actually were. More disturbing, with Brannan-parity prices on the 10 priority commodities ranging from 4 to 80 per cent higher than actual market prices, a strong incentive for a large, distorted expansion of farm production in 1955 and later years would have existed. Other advocates of compensatory prices would use them only in depression and then only to attain modest intended prices, but such a program would provide no income assistance under 1955 conditions.

For purposes of exposition, most of the following discussion takes the approach of seeing how good a case can be made for a modified compensatory price program for agriculture. Many minor details are omitted in the interests of brevity. At the other extreme, some broad and highly important issues relating to compensatory payments have been thoroughly discussed by several writers and are here mentioned only in passing. Specific levels of income support, allotment percentages, etc., suggested in the paper are illustrative only.

Outline of Suggested Program

The program described here calls for assigning marketing allotments on historical bases to producers. With certain exceptions, the total of

[1] Base surplus plans have attempted to pay farmers only the surplus price for above-quota production during the flush season and have thus used the marginal principle on the supply side in an attack on the seasonality problem. When bases were frozen in the early 1930's, some of these plans in effect applied the marginal principle on an annual basis, but too late and under too adverse circumstances to do any good.

producer allotments for each commodity is to be about 75 per cent of total marketings in a base period. Market prices are not to be supported nor production controlled. If market prices fall below intended prices, direct, compensatory payments are made on marketings not in excess of each producer's allotment. Quantities in excess of allotments may be marketed but return only the market price to the producer. The total marketing allotment for each commodity is fixed, but the total is distributed among producers according to sales over a three or four year period; consequently, allotments can shift slowly among producers.

Thus the attempt to use price for both income and resource allocation objectives is made by dividing each producer's output of each designated commodity into a major portion receiving income support and a residual portion on which the market value of marginal production is realized. The program is to include as many commodities as economic and administrative considerations permit. Twenty products are suggested for inclusion initially. The proposal is inherently an industry-wide program, and the allotments, unlike current marketing quotas, are not voted "in" or "out" by producers of individual commodities.

Many questions are at once raised, but discussion of them is deferred until some further general comments have been made. First of all, it seems inescapable that some allotment device be used if price is to play a dual role. Probably this has been the principal practical reason why the approach outlined here has not been much discussed. This is indeed a formidable difficulty. But if we can get over the problem of allotments, other problems seem less difficult. In contrast, a program like the one now in operation for basic commodities has not only the allotment problem but also the numerous and, in the aggregate, enormous difficulties arising from overpricing farmers' marginal production.

Even the brief outline of the proposal indicates that it is not essentially a new idea. In suggesting the Domestic Allotment program[2] in 1929, John D. Black proposed allotments that would divide each farmer's revenue into supported and unsupported portions. A later example of the idea is M. K. Bennett's insurance price system,[3] in which producer allotments would sum to 100 per cent of "normal crop marketings." Still more recently, Brinegar and Johnson[4] used a similar idea in a proposal that rights to receive extra income be represented by transferrable certificates.

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[2] John D. Black, *Agricultural Reform in the United States*, McGraw-Hill, 1929, Chapter X.

[3] M. K. Bennett, "A Price Policy For Agriculture," *This Journal*, XXVII, No. 4, November 1945, pp. 792-93.

[4] George K. Brinegar and Stewart Johnson, "On Letting Go Of The Bear's Tail," *This Journal*, XXXVI, No. 1, February 1954, pp. 30-43.

Details of Program

Consideration of the proposal reveals several points at which important questions must be answered. Some problems are not peculiar to this approach; they are difficulties, often neglected or glossed over, of devices in good repute among most agricultural economists. This is especially true of ordinary compensatory payments. They are frequently proposed, but only occasionally does an economist examine them in sufficient detail to reveal operational difficulties.[5]

Marketing allotments

Farm marketings over a three-year (or longer) period are to be used as the base for allotments. The total national allotment for a particular commodity is to be 75 per cent of sales during the base period used at the outset of the program. Quantities withheld from normal marketing channels by government for price support purposes are excluded from total sales for this purpose. Total allotments are *not* revised from year to year, at least in the early stages of the program.

The total allotment for a commodity is divided among producers according to average marketings (including crops put under loan and not redeemed) during the past three year period. Thus, individual farmers' allotments are adjusted slowly over time.

The slowly moving base for individual producers is a compromise between complete adherence to the marginal principle and elimination of inequities and inefficiencies inherent in any fixed base. The moving base does some damage to the marginal principle because a long-run increase or decrease in marketings will be evaluated by the individual producer at a weighted average of intended and market prices. If market prices are low, however, expansion of marketings ordinarily will not be remunerative while the base is being enlarged, and there will be little point in increasing the base unless marketings are to be kept permanently at the higher level. Thus, building up the base in face of low prices will be unlikely unless the efficient use of the farm's resources emphatically demands it. In such cases, it should be permitted.

The moving base may at first appear to cause a producer to be reluctant to cut down on a product in surplus, for this gradually lowers his allotment for that commodity. As a shift from one product to another is made, however, an allotment is built up for the second. The long-run position with respect to the supported portion of income is not necessarily

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[5] An example of a more critical analysis of compensatory price payments is provided in Chapter 13 of G. S. Shepherd's *Agricultural Price and Income Policy*, third edition.

changed. The accumulation of an allotment in the new enterprise may give the producer greater confidence in the wisdom of making the change and thus serve to encourage long-run adjustments of output. Quite likely, intended prices will be of some importance in shaping the pattern of production over the long run.

For some crops and in some areas, a three-year base will be too short to average out variations in weather satisfactorily. In these cases, blanket adjustments of individuals' allotments can be made by counties to correct for the difference between base yields and yields over a longer period of time.

Compensatory price payments

The advantages of compensatory price payments have been described in many places. Particularly important is the unobstructed flow of production into consumption. Consumers get more for their money (food prices and taxes), direct controls over farmers are avoided, open market prices give us bearing as to what an efficient allocation of resources in agriculture would be, and difficulties involved in diversion of products are avoided. Costs to the non-farm public are not materially different from costs of other programs affording a similar amount of income support. Farmers have been commonly thought to be opposed to direct payments, but a Michigan study[6] did not find this to be the case, and a less conclusive study in Pennsylvania[7] suggested that farmers there at least prefer direct payments to production control.

But direct payments on all of marketings have important disadvantages. The tendency of intended prices above the equilibrium level to induce greater output, lower market prices and larger demands on the Treasury has already been mentioned. In such a situation, intended prices guide production but may make as little economic sense as some support prices have made in the recent past. A strong inducement for fraudulent inflation of sales (or, at least, evidence of sales) by farmers is offered, and certain inequities among individuals are likely.

Making compensatory payments only on allotment quantities will substantially reduce some of the difficulties while retaining the income support function. Farmers' decisions to expand or contract an enterprise will be governed mainly by the value of marginal output. "Errors" in establishing intended prices will be less damaging to resource allocation than

[6] Dale E. Hathaway and Lawrence W. Witt, "Agricultural Policy: Whose Valuations," *This Journal*, XXXIV (3), pp. 299-309.

[7] G. E. Brandow, The Pennsylvania State University (unpublished data). It should be noted, however, that in such studies farmers are asked to compare a program (production control) with which they have had much irritating experience with one (direct payments) with which they have had little or no experience.

in the usual case, and government expenditures on the program are less likely to get out of hand over a period of years. As soon as a farmer accumulates evidence of sales equivalent to allotment quantities, he has less to gain from getting still more; hence, the encouragement for fraud is diminished. In establishing allotments, local committees can at least reduce the inequities that would otherwise occur.

Establishing intended prices

Intended prices will have some influence on farmers' long-run shifts of enterprises, and the *relationships* among intended prices should be as appropriate to resource allocation over the next several years as can be devised. But intended prices will directly affect farmers' incomes whenever market prices are lower, and this requires that intended prices be established by a clear, objective formula that is as immune as possible to political pressure. The modernized parity formula is fairly satisfactory for the purpose and enjoys the advantage of having finally established itself in current policy.

Income considerations are of particular importance in establishing the *average level* of intended prices The amount of money that Congress and the public are willing to see spent on farm income support imposes some upper limit on how ambitious the program can be, and indirect effects on resource allocation will also be of some importance. It would seem reasonable to try to keep the purchasing power of net income of farm operators from falling much below the 1954 position. As data presented later suggest, setting intended prices at 90 per cent of modernized parity might have approximately this result.

Livestock feeding and poultry not included

An ordinary compensatory price plan encourages short-term feeding of cattle and other livestock in order to build up large sales on which payments can be received. The plan described to this point would suffer from the same defect to an important extent. In general, reasons usually offered for supporting farmers' income are less convincing for feeding operations than for the usual farm enterprise in which fixed costs are high and for which close alternatives may be lacking. Accordingly, it is proposed that the program include only sales of livestock raised on the same farm or held there for some minimum time—for cattle, for example, perhaps 18 months.

Some of the same arguments apply to the broiler industry. The "value added" is low in relation to sales; a 3-pound broiler is little more than an animated 8 to 10 pounds of feed. The industry has considerable short-run adaptability and is highly dynamic. No formula for intended prices is likely to be very satisfactory. Distinguishing between broilers and farm

chickens for the purpose of making payments would be difficult, and chickens produced as a by-product of egg production do not need support if income from eggs is assisted. The situation for turkey broiler-fryers is similar to that for chicken broilers. Although the case for omitting roasting turkeys is less clear, it seems best to exclude all poultry from the program.

As indicated later, the proposal will lead to lower feed prices and marked expansion of poultry production. This will be a stimulant to farm businesses that purchase feed and process it into poultry meat.

Allotments for feed grains

Feed grains present a special and difficult problem for any compensatory payment plan. Farmers normally feeding all or most of their grain to livestock are given an incentive to sell grain and buy it back in the same or another form. Cash grain is important to many farmers, and at the present time some desired shifts out of wheat will mean substitution of other grains for sale; thus, feed grains can hardly be left out of the program. A further complication is that national allotments for barley and grain sorghums based on recent non-diverted marketings would be too small to carry the burden of desired production shifts.

A different but consistent method of computing allotments for feed grains is outlined by the following figures for a particular farm:

Corn units marketed, past 3 years		Grain	Corn units		Allotments	
Product	Units		Produced, past 3 years	Excess	Corn units (75%)	Bushels of grain
Hogs	2000	Corn	2500	1000	750	750
Eggs	500	Oats	500	200	150	292
Milk	500	Barley	2000	800	600	737
Total	3000	Total	5000	2000	1500	

Production of feed grains is converted to corn units in terms of feeding value. Marketings of livestock products eligible for payments are converted to corn units on the basis of average grain input per hundred weight or other unit sold. Any excess of production over marketings is prorated to the grains and multiplied by 75 per cent to give the allotments. "Corn units marketed" are computed from the same quantities used to establish marketing allotments for livestock. If a farmer under-reports these, his livestock allotments are automatically reduced and his feed grain allotments increased. Grain produced for feeder cattle or poultry meat (on which payments are not made) becomes eligible for income support just as is cash grain. For administrative simplicity but at further loss of pre-

cision, production of feed grains could be reckoned at actual acreages multiplied by county average yields. The allotment percentage, here 75 per cent, can be varied in light of experience, and this may be necessary because the national allotments are not frozen.

Minor commodities and small allotments

Many of the individual fruits and vegetables would present special problems and, at least at the outset, would not be included in the program. Neither would be relatively unimportant and specialty products. Of all commonly proposed income support plans, however, compensatory price payments are the easiest to extend to such products as fruits and vegetables.

No allotments would be assigned below minimum quantities established for the various commodities. The purpose would be to avoid small payments that are costly to administer and unimportant to the recipient.

Relation of existing programs to the proposal

The proposed program would fully replace all price support programs after an interval of perhaps two years. Stocks currently withheld from market by the Commodity Credit Corporation would not re-enter normal marketing channels except in emergency, and attempts to dispose of them would proceed as at present. Marketing agreements and orders would be continued but less emphasis would be placed on price raising functions. The School Lunch Program would be run on strictly nutritional lines.

During the first two years of the new program, price supports at low levels might be useful to assist in the transition from current supports to free prices. The proposed program cannot operate effectively until livestock, dairy and poultry production on the one hand and feed grain production on the other come approximately into balance, and low price supports on grains would be desirable to prevent an immediate glut of grains followed by an overexpansion of livestock production later on. Supports at perhaps 60 per cent of modernized parity seems appropriate during the changeover.

Direct and indirect export subsidy programs would be discontinued once CCC stocks were reduced. In the writer's view, the United States should not use its enormous non-agricultural income to subsidize its farmers in competition with foreign producers; but neither should it withdrew from world markets in attempting to raise domestic prices. A policy of holding and expanding export markets in which prices cover marginal costs of production seems to be the consistent and defensible position for the United States to take, and the modified compensatory price program would do this particularly well.

Advocates of stabilization of supplies through storage will observe that

the program could be superimposed on the one proposed here. Credit and other forms of assistance to farmers in making farm management adjustments would be not only possible but desirable.

Application to a commodity in acute surplus

Overproduction of wheat has been so great that only about 70 per cent of the wheat marketed by farmers during 1952-54 was disposed of in usual marketing channels. An allotment based on 75 per cent of non-diverted marketings might amount to only about half of total marketings at the outset of the program. Since both wheat allotments and prices would be especially low, growers' incomes would drop very sharply from the 1954 position. Moreover, although low prices would restrict output, an additional incentive in this direction would be desirable.

Accordingly it is suggested *as a transitional measure* that (a) the national allotment for wheat be made 100 per cent of base-period non-diverted marketings, (b) acreages as well as marketing allotments be assigned to growers, and (c) compensatory payments be made only to growers complying with acreage allotments. The moving base for individual allotments would not be in use while the special provision was in effect. As wheat production declined and prices improved, the income advantage for growers would swing away from the special arrangement to the one in use on other commodities, and the change could readily be made.

Effects on the distribution of farm income

Since the program will assist farmers in proportion to marketings, it will be of little help to families on small, inadequate farm units. It is a program for commercial farmers, as are the programs currently in operation and as have been virtually all income support proposals, including the Brannan Plan. Completely different approaches are needed to deal with problems of severely low income farmers.

Several considerations suggest that an upper limit should be placed on the amount paid to a single individual in one year. Giant farms ordinarily have less need for income support than do many family-size farms. In most types of agriculture the larger family-size farms appear to be as efficient as very large units, and on other than economic grounds it seems desirable to encourage family-size farms so long as this remains true. Last but not least, public acceptance of the whole program will be undermined if it becomes widely known that payments running well into five figures have been made to a few individuals, regardless of the merits of the case.

Administration

The task of assigning allotments, checking evidence of sales to determine eligibility for payments, and making disbursements is the principal ad-

ministrative problem, and it is a difficult one. Experience with quotas and allotments for basic commodities indicates rather clearly that the allotment part of the job can be handled if enough money is put into it. The fact that allotments are to be revised annually increases the work but makes it possible to improve the accuracy of allotments and to correct inequities with the passage of time. During the 1930's and World War II, some experience was acquired in making direct payments, and more is being gained under the current wool program.

Much more information will be required from farmers than under the principal current programs.[8] Probably a system of comprehensive, integrated reports will be more efficient and accurate than a set of haphazard reports for individual commodities. Many farmers are certainly going to object to this as too much red tape. But this program is mainly for farmers, and it is appropriate that those who benefit most from it should shoulder a substantial part of the administrative effort required. If any farmer does not consider the benefits worth the work required of him, he is under no compulsion to do it. His allotments and payments merely are reduced, perhaps to zero, by any deficiencies in evidence of sales.[9]

It is easy to exaggerate the difficulties of the proposal in comparison with those of other programs. The administrative effort required by the proposal is concentrated at one level close to farmers where it can be easily seen and appreciated. In contrast, the administrative difficulties of present programs include other major problems such as conducting a large storage operation and extend to such remote matters as making peddlers of surpluses out of agricultural attachés.

Application to the Current Situation

What would happen to farm prices and income if the program were operating under current conditions, and how much would the government have to pay out in compensatory payments? These highly important questions cannot be dodged, though any cautious writer would like to avoid them. Estimates presented in Tables 1, 2 and 3 have been worked out, but such estimates do no more than suggest very crudely some of the changes from the 1954 situation. This must be emphasized despite the estimates' appearance of considerable precision.

The estimates are based on the assumption that demand for agricultural products and costs of inputs stay about as they were in 1954 but that the proposed program has been in effect for at least 18 months prior to the year for which estimates are made. The reason for the lag is that attain-

[8] The book work for farmers will be no greater than under an ordinary compensatory price plan. Allotments add work only for local offices.

[9] Especially when market prices are high, some farmers will make no reports or claims. Estimates of unreported marketings will be used in summing up farmers' sales in order to prevent inflation of the allotments of reporting farmers.

ing even a temporary equilibrium under the proposed program requires feed supplies and livestock, dairy and poultry production to be brought into line with each other. On the assumption that feed supplies will be greater rather than less under the program (feeding of wheat, for example, will increase sharply), expansion of grain-consuming animal units will be required. In the short-run, this will take the form of larger hog, poultry and egg production and more feeding of grain to beef cattle. This is the temporary equilibrium for which estimates are made. In the longer run, expansion of beef cattle numbers and of production of milk for fluid consumption and for certain manufacturing uses would take place.

If one had a set of structural equations describing supply and demand for all leading farm products in all their interrelatedness, and if the parameters of the system had been reliably measured, the estimates required here could be put forward with considerable confidence. But such a system is, of now, only a dream. Recourse must be had to often uncertain statistical estimates for partial systems and to a large element of judgment. There is almost no statistical evidence on the supply side of the problem, and empirically derived estimators on the demand side either are not wholly appropriate for this particular purpose or for other reasons yield results that are sometimes too inconsistent to be acceptable. Estimates were made in the late spring of 1955.

Allotments and marketings

Estimates of allotments and marketing are presented in Table 1. The base period is 1952-54. Commodities bought by CCC and not resold, plus increases in commodities under CCC loan, over the period from July 1, 1952 to December 31, 1954 were considered to have been diverted from usual marketing channels. Better estimates could undoubtedly be made from a detailed analysis of surplus disposal operations.

Allotments were computed at 75 per cent of marketings not diverted, except for wheat and feed grains for which special provisions described above were assumed to be in effect. The estimates of farm marketings are no more than thoughtful guesses, except for livestock and poultry. In making the livestock and poultry estimates, a more objective approach was used. In broad outline, it involved (a) estimating the total tonnage of feed concentrates (including considerable wheat) available under the program; (b) computing feed requirements for livestock other than hogs and poultry on the assumption of small declines in numbers of dairy cattle, horses and mules, a 20 per cent increase in cattle on feed, and no change in sheep numbers; (c) estimating the resulting tonnage of feed concentrates available under the program for hogs and poultry; (d) writing 1954 demand equations for hogs, eggs, farm chickens, broilers and

turkeys by using actual 1954 prices and marketings and by utilizing price elasticities of demand employed by Mehren[10] or suggested by some results of Fox[11]; (e) determining feed requirements per 100 pounds of hog, chickens, etc., marketed;[12] (f) deciding upon normal hog-corn, egg-feed and other price ratios; (g) substituting quantities of feed for quantities of livestock products, and a composite price of feed for prices of livestock prod-

TABLE 1. ASSUMED PROGRAM ALLOTMENTS AND MARKETINGS COMPARED WITH ACTUAL 1952–54 MARKETINGS

Product	Unit	Farm marketings, 1952–54[1]	Marketings not diverted, 1952–54	Program quantities	
				Allotments	Farm marketings
Wheat	mill. bu.	1024	709	709[2]	800
Cotton	mill. bales	15.06[3]	12.37	9.28	13
Corn	mill. bu.	927	791	712[4]	950
Rice	mill. cwt.	51.7	46.7	35.0	50
Tobacco	mill. lb.	2170[3]	2056	1542	2200
Peanuts	mill. lb.	1279	1309	982	1350
Oats	mill. bu.	316	290	232[4]	310
Barley	mill. bu.	178	151	176[4]	235
Grain sorghums	mill. cwt.	50.7	33.1	56[4]	75
Soybeans	mill. bu.	288	280	210	350
Milk, whole	bill. lb.	86.2	84.6[5]	63.5	90
Butterfat	mill. lb.	642	500	375	550
Cottonseed	mill. tons	5.5	4.9	3.7	4.8
Wool	mill. lb.	271[3]	225	169	276
Cattle[6]	mill. cwt.	171	171	128	190
Calves[6]	mill. cwt.	24	24	19	34
Sheep[6]	mill. cwt.	3.0	3.0	2.2	3.0
Lambs[6]	mill. cwt.	9.8	9.8	7.4	11.1
Hogs[6]	mill. cwt.	171	171	128	211
Eggs	mill. doz.	4675	4675	3506	4942
Farm chickens	mill. cwt.	17.0	17.0	—	17.2
Broilers	mill. cwt.	29.7	29.7	—	37.8
Turkeys	mill. cwt.	10.2	10.2	—	11.1

[1] Crop years or calendar years.
[2] 100 per cent of marketings not diverted 1952–54.
[3] Production.
[4] Special feed grain provision; estimated at 75 per cent of marketings.
[5] Allows for diversion of cheese but not of dry non-fat solids.
[6] First sales only. Interstate shipments were taken as a measure of the numbers of livestock sold as feeders.

ucts, in the demand equations; (h) combining these to express feed utilization as a function of the price of feed; and (i) finding the composite feed price required to move the available tonnage of feed into consumption

[10] George Mehren, "Comparative Costs of Agricultural Price Support in 1949," *American Economic Review*, XLI (2), May 1951, pp. 717-746.

[11] Karl A. Fox, "Factors Affecting Farm Income, Farm Prices and Feed Consumption," *Agricultural Economics Research*, III (3), July 1951, pp. 65-82.

[12] Based on R. D. Jennings, *Animal Units of Livestock Fed Annually 1919-20 to 1948-49*, U.S.D.A., B.A.E., October 1949, p. 16, except for a more up-to-date figure for broilers.

through hogs and poultry. This lengthy procedure yielded estimates of marketing of hogs, farm chickens, broilers, eggs and turkeys, their prices, and the composite price of feed.

Prices and payments

In general, farm prices under the program were estimated by starting with 1954 prices and nondiverted marketings and by adjusting prices for

TABLE 2. ASSUMED PRICES, VALUE OF MARKETINGS AND PAYMENTS UNDER THE PROGRAM

Product	Price unit	Farm price, 1954	Program results			
			90 per cent of parity[1]	Farm price	Value of marketings	Direct payments
		dol.	dol.	dol.	mill. dol.	mill. dol.
Wheat	bu.	2.05	1.95	1.35	1,080	315[2]
Cotton	lb.	.324	.310	.275	1,788	162
Corn	bu.	1.46	1.46	1.15	1,092	221
Rice	cwt.	4.66	4.93	3.10	155	64
Tobacco	lb.	.506[3]	.464	.43	946	52
Peanuts	lb.	.114	.100	.10	135	—
Oats	bu.	.745	.778	.60	186	41
Barley	bu.	1.08	1.22	.90	212	56
Grain sorghums	cwt.	2.27	2.30	1.80	135	28
Soybeans	bu.	3.04	2.63	1.90	665	153
Milk, whole[4]	cwt.	4.01	4.23	3.60	3,240	400
Butterfat	lb.	.585	.668	.53	292	52
Cottonseed	ton	55.30	64.34	50.00	240	53
Wool	lb.	.53[3]	.532	.45	124	14
Cattle	cwt.	16.30	19.30	15.75	4,489[5]	454[6]
Calves	cwt.	16.90	21.15	16.50	561[5]	84[6]
Sheep	cwt.	6.44	9.16	6.00	23[5]	7[6]
Lambs	cwt.	19.30	21.15	19.00	291[5]	16[6]
Hogs	cwt.	22.10	19.30	14.50	3,103[5]	614[6]
Eggs	doz.	.364	.42	.35	1,730	245
Farm chickens	lb.	.17	.17	.16	275	—
Broilers	lb.	.231	.23	.19	718	—
Turkeys	lb.	.288	.29	.27	300	—
Total					21,780	3,031

[1] Modernized parity; computed as of April 1955.
[2] Assumes ¾ compliance in special program.
[3] Approximate.
[4] Prices and values are figured at wholesale though some milk is retailed.
[5] Includes marketings of all fed livestock as well as first sales.
[6] Payments on first sales only.

changes in marketings expected under the program. Mehren's price elasticities of demand were used.[13] The long calculation described above provided, directly or indirectly, estimates of prices of hogs, eggs, farm

[13] George Mehren, *op. cit.* His elasticity for milk was reduced to — .4, however. (All equations, including those for livestock, were in terms of logs.)

chickens, broilers, turkeys, corn, oats, barley and grain sorghums. The price of wheat was put about at its feeding value in relation to corn. Some modifications were made on a judgment basis, however, to achieve greater internal consistency.

Table 2 probably does reliably indicate the commodities that would

TABLE 3. ESTIMATED FARM INCOME FROM MARKETINGS AND PAYMENTS UNDER THE PROGRAM COMPARED WITH 1954 INCOME

Class of product	1954 income from marketings[1]	Program results		
		Income from marketings	Direct payments	Total
	millions of dollars			
Livestock and products				
Meat animals	9,107	8,467	1,175	9,642
Dairy products	4,116	3,700	452	4,152
Poultry and eggs	3,198	3,075	245	3,320
Other	263	250	14	264
Total	16,684	15,492	1,886	17,378
Crops				
Food grains	2,139	1,250	379	1,629
Feed crops	2,340	1,940	346	2,286
Cotton (lint and seed)	2,584	2,035	215	2,250
Oil crops	1,004	805	153	958
Tobacco	1,162	945	52	997
Vegetables	1,620	1,600	—	1,600
Fruit and nuts	1,240	1,240	—	1,240
Other	1,181	1,100	—	1,100
Total	13,270	10,915	1,145	12,060
All farm products	29,954[2]	26,407	3,031	29,438

[1] *The Farm Income Situation*, A.M.S., U.S.D.A., March 4, 1955, p. 11.

[2] In addition to income from marketings, farmers received 218 million dollars in conservation payments and 40 million under the Sugar Act. The former, at least, would continue under the program.

experience the greatest price declines and those on which largest payments would be made. In general, prices would encourage a shift toward a livestock economy, and a large portion of the payments would be made on cattle, hogs and dairy products. The encouragement of livestock, poultry and dairy (except butterfat) would be consistent with prospective demand developments and with soil conservation objectives. The prices given in Table 2 imply that the index of prices received by farmers, which was 249 in 1954, would decline to about 215 under the program.

Under the above assumptions, direct payments on the 20 products considered eligible would amount to 3.0 billion dollars. The total value of

marketings of these commodities (farm chickens, broilers and turkeys not included) would be 20.5 billion dollars.

Farm income

Total income from marketings might be expected to decline from 30.0 billion dollars in 1954 to 26.4 billion dollars under the program. Direct payments, however, would pull cash income up to within 0.5 billion dollars of the 1954 position; and reduce expenditures for feed because of lower prices might equal this amount. Income from meat animals and eggs would increase; income from food grains, cotton and tobacco would decline materially. The non-farm public would pay to farmers via the market and direct payments about the same amount as farmers received under price support in 1954, and in return consumers would obtain a larger volume and more desired combination of farm products.

Concluding Remarks

The modified compensatory price plan has been examined as a possible means of providing some income support for farmers in a situation like 1953-55. If one's objectives do not include such support but emphasize mainly the efficient allocation of resources or a minimum of government intervention, he can find other policies superior to the proposal. If his objectives do include this support, he will wish to compare the proposal with other programs intended to provide equivalent farm income.

The proposal appears to have several advantages over an ordinary compensatory plan if an important amount of income assistance is to be provided for more than a year or two. The principal disadvantage, the marketing allotments, can be surmounted, but only at a higher cost of administration. In comparison with diversion-to-storage and production control, the proposal has most of the advantages that have so often been argued for ordinary compensatory payments. The suggested program is particularly consistent with the United States' objectives in international trade and foreign policy.

The advantages of dividing farmers' production into a major portion eligible for income support and a residual portion priced at the marginal value of output seem to be great enough that obvious administrative difficulties should not easily divert attention from the plan. More detailed and critical analysis will certainly reveal numerous minor difficulties and will perhaps revise some major conclusions. In view of the difficulties of all realistic alternatives before us today, the modified compensatory price plan may be the most satisfactory, or least unsatisfactory, available course of action.

BENEFITS VERSUS COSTS OF PRICE SUPPORTS

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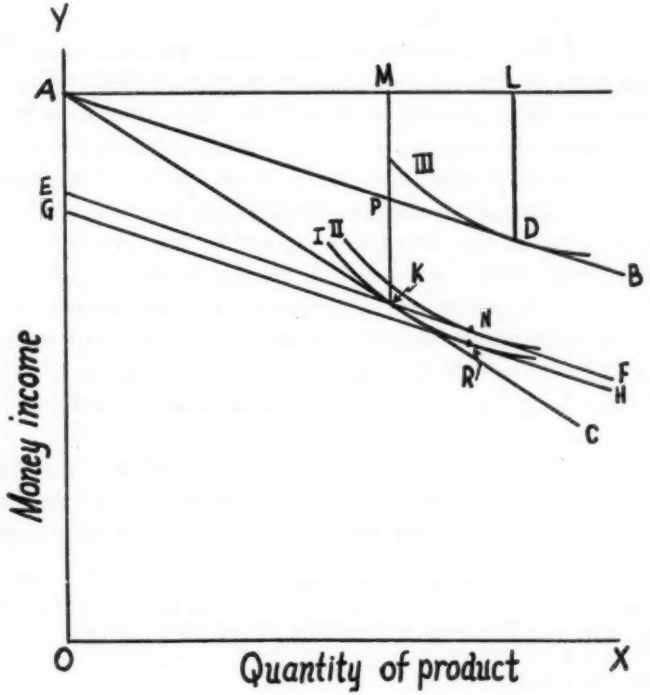
L. D. HOWELL in a highly interesting paper,[1] sets out to compare the benefits and costs of price support for agricultural products. To my knowledge, his arguments have not as yet been questioned. One of his results, which concerns the effect of price supports on the welfare of consumers, is arrived at with the use of an indifference curve diagram. This diagram is familiar from the extensive discussions on the welfare effects of direct taxes versus excise taxes.[2]

[1] "Benefits versus Costs of Price Supports", *Quarterly Journal of Economics*, LXVIII, Feb., 1954, 115-30.

[2] M. F. W. Joseph, "The Excess Burden of Indirect Taxation," *Review of Economic Studies*, VI, June 1939, 226-31; J. R. Hicks, *Value and Capital* (Oxford, 1939), p. 41; M. W. Reder, "Welfare Economics and Rationing," *Quarterly Journal of Economics*, LVII, Nov., 1942, 153-55; Haskell Wald, "The Classical Indictment of Indirect Taxation," *Quarterly Journal of Economics*, LIX, Aug., 1945, 577-96; George J. Stigler, *Theory of Price* (New York: Macmillan Co., 1946) pp. 81-82; Edward D. Allen and O. H. Brownlee, *Economics of Public Finance* (New York: Prentice Hall, 1947) pp. 343-45; A. Henderson, "The Case for Indirect Taxation," *Economic Journal*, LVIII, Dec., 1948, 538-53; Kenneth E. Boulding, *Economic Analysis* (rev. ed.; New York: Harper & Bros., 1948) pp. 773-75; T. Peacock and D. Berry, "Note on the



For convenience of reference, one of Howell's figures is reproduced here.[3] Money income is measured along the y-axis and the product X along the x-axis. These indifference curves I, II, and III show the individual consumer's scale of preference between money income and product X. It is assumed that the consumer has money income OA. The slope of AB represents the price of the product without price support which is tangent to the indifference curve III at D. The consumer will purchase AL quantity of the product with DL amount of his income. The slope of AC represents the price of the product following the price support program. AC is tangent to the indifference curve I at K; AM is the quantity purchased; MK, the amount of money paid for it, and KP, the additional costs to the consumer of AM quantity of the product following the price support. Mr. Howell then proceeds to prove that the detriments to consumers would exceed the additional costs to consumers for the products purchased following the price advance. He draws EF parallel to AB through K and tangent to indifference curve II at N. The shift from AB to EF represents a reduction in consumers' income by KP because of the price support. He concludes that "the fact EF is tangent to an indifference curve superior to that to which AC is tangent indicates that the well-being of the consumer, measured in terms of money equivalents, would be reduced more by raising prices from AB to AC than by a decrease in his income equal in amount to the additional costs of the quantity AM of the products as a result of this price advance."[4]

The similarity of Howell's conclusion to that of the welfare effects of the income tax versus excise tax is striking. It is very easy to draw the parallels between the two cases. Insofar as the consumers are concerned, the price rise of the product X is similar to the price advance of the same commodity following an excise tax. Howell tries to compare the reduction in the well-being of the consumers caused by the price rise with a decrease in income which is equal in amount to the additional costs of the high price. This procedure is equivalent to comparing welfare effects of collecting an identical amount of tax payments from consumers by excise tax or by income tax. What his arguments amount to, when translated into the language of public finance, is that the indirect taxes constitute an excess burden.

Once the parallel between the two cases is drawn, the flaw in his conclusion is not hard to see, because the pitfalls implicit in the indifference diagram approach were first debated in the Frisch-Hotelling ex-

Theory of Income Distribution," *Economica*, N. S. XVIII, Feb., 1951, 83-90; E. Schwartz and D. A. Moore, "The Distorting Effects of Direct Taxation: A Re-evaluation," *American Economic Review* XLI, March 1951, 139-48.

[3] *Ibid.*, Figure 2.

[4] *Op. Cit.*, pp. 120-21.

change.[5] Frisch seemed to have failed to see the force of Hotelling's emphasis on the conditions of cost of production in the analysis. More recently, the graphic proof has been critically examined by Earl R. Rolph and George F. Break, I. M. D. Little, Milton Friedman and Cecil G. Phipps.[6] The essence of the criticism is that the indifference diagram approach makes no overt reference to marginal costs, yet we know that the case against indirect taxation is merely a special case of conflict with one of the necessary conditions for the achievement of a Pareto "optimum", namely, relative marginal costs be equal to relative prices.

Following Little's arguments, let us assume that there are three goods in a perfectly competitive economy, with one of the goods being leisure. We shall designate leisure by L, the two goods by X_1 and X_2, and the marginal rate of substitution and the marginal rate of transformation by MRS and MRT for short. We have:

I For direct taxation

$$\text{MRS} = \text{MRT for the pair } (X_1 \text{ and } X_2)$$
$$\text{MRS} \neq \text{MRT for the pair } (X_1 \text{ and L})$$
$$\text{MRS} \neq \text{MRT for the pair } (X_2 \text{ and L})$$

II For indirect taxation: (assuming X_1 to be taxed)

$$\text{MRS} = \text{MRT for the pair } (X_2 \text{ and L})$$
$$\text{MRS} \neq \text{MRT for the pair } (X_1 \text{ and } X_2)$$
$$\text{MRS} \neq \text{MRT for the pair } (X_1 \text{ and L})$$

It is clear that whatever can be said of indirect taxation (or, the burden to the consumers caused by advances in prices by price supports) is equally applicable to direct taxation (or, a reduction in money income equal in amount to the additional cost to the consumers as a result of price advance) and that, consequently, Howell's arguments against price supports cannot be established as a general case on theoretical ground.

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[5] Harold Hotelling, "The General Welfare in Relation to Problems of Taxation and of Railway and Utility Rates," *Econometrica*, VI, July 1938, 242-69, "The Relation of Prices to Marginal Costs in an Open System," *Econometrica*, VII, April 1939, 151-55, and "A Final Note," *Econometrica*, VII, April 1939, 158-60; R. Frisch, "The Dupuit Taxation Theorem," *Econometrica*, VII, April 1939, 145-50, and "A Further Note on the Dupuit Taxation Theorem," *Econometrica*, VII, April 1939, 156-57.

[6] E. R. Rolph and G. F. Break, "The Welfare Aspects of Excise Taxes," *Journal of Political Economy*, LVII, Feb., 1949, 46-54; I. M. D. Little, *A Critique of Welfare Economics* (Oxford 1950), pp. 157-79, and "Direct *versus* Indirect Taxes," *Economic Journal*, LXI, Sept., 1951, 577-84; M. Friedman, "The 'Welfare' Effects of an Income Tax and an Excise Tax," *Journal of Political Economy*, LX, Feb., 1952, 25-33, and "A Reply," *Journal of Political Economy*, LX, Aug., 1952, 334-36; C. G. Phippis, "Friedman's 'Welfare' Effects," *Journal of Political Economy*, LX, Aug., 1952, 332-34.

NOTES

A ROW SUM CHECK UPON COMPUTATIONAL ACCURACY IN MATHEMATICAL PROGRAMMING PROBLEMS*

ONE of the practical difficulties we have experienced in using mathematical programming has been the lack of adequate checks upon computational accuracy when the "Simplex" formulation is employed.[1] The checks outlined by Charnes, Cooper, and Henderson[2] are useful for cases in which all of the processes in the program have a non-zero "c_j" value (or price). Their procedure does not, however, check the accuracy of the calculations for the processes having zero "c_j" values. Moreover, the discovery of a discrepancy between "$z_j - c_j$" values computed by the two methods identifies only the column in which the error occurs. This difficulty exists even though all of the processes have non-zero "c_j" values.

TABLE 1. BOLES' TABLEAU 1 WITH ROW CHECK SUMS[1]

c_j			0	0	0	3	2	4	1	Row Check Sum
	P_j	P_0	P_5	P_6	P_7	P_1	P_2	P_3	P_4	
0	P_5	2	1	0	−1/4	3/4	1/4	0	1/2	4 1/4
0	P_6	2	0	1	−1/2	7/2	1/2	0	1	7 1/2
4	P_3	2	0	0	1/4	1/4	3/4	1	1/2	4 3/4
z_j		8	0	0	1	1	3	4	2	
$z_j - c_j$			0	0	1	−2	1	0	1	

[1] See Table 4 page 16, op. cit.

I have found it convenient to add a column at the right of the "Simplex" layout in which row sums are carried. As a check, the entries in this column for all but the first tableau are computed in two ways. First, they are obtained in the same manner as are the other entries in the corresponding rows. Then, they are obtained by summing algebraically the other entries in the same row. The entries for the first tableau are obtained by algebraic summing of the entries in the same row.

Boles' example[3] provides a convenient means of illustrating this checking procedure, especially since an error occurs in the example. Table 1

* Authorized for publication on July 14, 1955 as paper No. 1996 in the Journal Series of the Pennsylvania Agricultural Experiment Station.

[1] Several articles have appeared in the *Journal of Farm Economics* which made use of the "Simplex" formulation. The excellent article by James N. Boles in February 1955 issue provides an example of its application.

[2] *An Introduction to Linear Programming*, p. 18.

[3] *Op. cit.*

below is Boles' Table 4 plus the row check sum column. Table 2 (a) below is Boles' Table 5 plus the row check sum column. The entries in the row check sum column in Table 2 (a) are the algebraic sums of rows as they appear in Boles' Table 5. When these sums are checked by calculating the row sums in the same manner as the other row entries, errors become apparent. The values obtained by this method of calculation are:

Row P_5	2 9/14
Row P_1	2 1/7
Row P_3	2 3/14

In this case visual inspection reveals that there is an error in the cell at the intersection of the P_4 column and the P_1 row. The correct entry for

TABLE 2(a). BOLES' TABLEAU 2 WITH ROW CHECK SUMS[1]

c_j			0	0	0	3	2	4	1	Row Check Sum
	P_j	P_0	P_5	P_6	P_7	P_1	P_2	P_3	P_4	
0	P_5	11/7	1	−3/14	−1/7	0	1/7	0	1/2	2 6/7
3	P_1	4/7	0	2/7	−1/7	1	1/7	0	0	1 6/7
4	P_3	13/7	0	−1/14	4/14	0	5/7	1	1/2	4 2/7
z_j		$9.14	0	4/7	5/7	3	23/7	4	2	
z_j-c_j			0	4/7	5/7	0	9/7	0	1	

[1] See Table 5, page 18, op. cit.

this cell is $1 \div 7/2 = 2/7$ rather than zero as in Table 2 (a). Since this entry was used in the calculation of the cells at the intersection of row P_5-column P_4 and row P_3-column P_4 of Table 2 (a), these entries are also in error. Table 2 (b) below presents the results after these corrections are made. The row check sum in Table 2 (b) is verified when calculated in the manner of the other cells in the same row.

The failure of the checks outlined by Charnes, *et al.* is demonstrated in the foregoing illustration. The error in the cell at the intersection of the P_5 row and the P_4 column of Table 2 (a) would not have been discovered through the application of these checks. In this case the error would probably have been discovered indirectly upon application of these checks since it depended upon a cell entry that was subject to check by the usual procedures (i.e. the cell at the intersection of the P_1 row with the P_4 column). In other problems, however, this would not necessarily be the case.

Normally this row sum check will require additional computations although the computation of the "z_j-c_j" row by one of the two methods

outlined by Charnes, *et al.* may be omitted. In any event this check will save effort in locating the errors within columns. In problems of considerable size this saving alone will be worth the additional effort. With both the row sum and the Charnes, *et al.* check the cell containing the error can be identified.

This method of checking has been particularly useful in problems having only one process with positive "c_j" values. I have set up enterprise choice problems, for example, with between enterprise transfer processes such that only a "gross" or "net" income producing process has a positive "c_j" value. I have also used such a formulation in "mix" problems where the object was that of maximizing the level of the "mix process." In these cases, the "z_j" and "$c_j - z_j$" rows can be directly and simply inferred from the row corresponding to the single process having a positive "c_j".[4] Therefore, there is no need for computing either the "z_j" or the "$z_j - c_j$." This leads to a considerable saving in effort permitted by the row sum method of checking. The computation of "$z_j - c_j$" by two methods, following Charnes, *et al.*, gives a check upon only a small portion of the total tableau in such cases whereas the row sum method here outlined will monitor all entries.

TABLE 2(b). BOLES' TABLEAU 2 AFTER CORRECTIONS

C_j			0	0	0	3	2	4	1	Row Check Sum
	P_j	P_0	P_5	P_6	P_7	P_1	P_2	P_3	P_4	
0	P_5	11/7	1	−3/14	−1/7	0	1/7	0	2/7	2 9/14
3	P_1	4/7	0	2/7	−1/7	1	1/7	0	2/7	2 1/7
4	P_2	13/7	0	−1/14	4/14	0	5/7	1	3/7	4 3/14
z_j		39.14	0	4/7	5/7	3	23/7	4	2 4/7	
$z_j - c_j$			0	4/7	5/7	0	9/7	0	1 4/7	

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[4] Provided no negative "c_js", if any, remain in the program.

VARIABILITY OF RETURNS FROM THE HOG ENTERPRISE

THE wide variation among producers in the financial success[1] of the hog enterprise has been noted by farm record analysts.[2] These differences in returns are usually attributed to variations in the swine man-

[1] Return per $100 feed fed is used as a measure of financial success in this note. Feed costs comprise approximately 75 percent of total costs in hog production. It should also be recognized that any measure of the financial success of an individual

agement skills of the producers. Our purpose in this note is to indicate that this degree of variation might be overestimated when farm record results for a single year or for a few years are considered.

The method of analysis of variance[3] was used to analyze the data from 143 hog producers in ten Illinois counties[4] over the ten-year period 1936-45. Although analysis of variance is not a perfect tool for problems of this nature,[5] it is believed that its use may give us certain insights.

The following table shows the results of the analysis of variance.

Source of variation	Degrees of freedom	Sum of squares	Mean square	Mean square is estimate of
Producers	142	601,917	4,239	$\sigma^2 + 10\,\sigma_p^2$
Years	9	1,367,413	151,935	$\sigma^2 + 143\,\sigma_y^2$
Deviations	1,278	2,924,349	2,288	σ^2
Total	1,429	4,893,679		

The variances corresponding to the three sources of variation may be designated as follows:

σ_y^2 = variance associated with years
σ_p^2 = variance associated with producers
σ^2 = variance unexplained (deviations)

From the analysis of variance table we may compute the following estimates of each of these variances:

$\sigma_y^2 = 1{,}046$ $(\sigma_y = 32)$
$\sigma_p^2 = 195$ $(\sigma_p = 14)$
$\sigma^2 = 2{,}288$ $(\sigma = 48)$

Thus, we see that, of the three sources, the one attributable to individual producers is the smallest and the deviation, or unexplained variance, is the largest.

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enterprise taken out of context of the total farm business usually suffers from failure to account adequately for the inter-relationships among enterprises.

[2] E.g., Case, H. C. M. and Ross, Robert C., *The Place of Hog Production in Corn-Belt Farming*, Illinois Agricultural Experiment Station Bulletin 301, 1927. Also Wilcox, R. H. *et al.*, *Some Important Factors Affecting Costs in Hog Production*, Illinois Agricultural Experiment Station Bulletin 390, 1933. More recent data showing the apparent wide variation among producers in returns per $100 feed fed appear in the annual reports of the Illinois Farm Bureau Farm Management Service.

[3] See any standard statistical methods reference, e.g., Snedecor, G. W., *Statistical Methods*, Iowa State College Press, Ames, 1946. For the use of analysis of variance in a similar type of problem see Rasmussen, K., "The Importance of Variance in the Interpretation of Averages." *Journal of Proceedings of the Agricultural Economics Society*, 10:226-237, September 1953.

[4] Bureau, De Kalb, Henry, Kendall, Knox, Livingston, McLean, Peoria, Tazewell, and Woodford.

[5] Eisenhart, Churchill, The Assumptions Underlying the Analysis of Variance, *Biometrics* 3:1-21, March 1947.

We may indicate the relative importance of these three sources by assuming three different hypothetical situations based on the above data. First, let us assume that all producers had the same returns in each year but that the annual variation is that shown by the data. Since the average return for the 143 producers for the ten-year period was $160, we assume in this first case that each individual producer had a ten-year average return of $160 per $100 feed fed. Thus we remove the effects of the producer and the unexplained variation. A range of $128 to $192 in return per $100 feed fed would then include approximately two-thirds of the observations.

A second assumed case will show the magnitude of the differences in returns due to differences among producers. Here we remove the yearly fluctuation in average returns for all producers and also again remove the effect of deviations. This would mean that the average return for each year for all producers was assumed to be $160. Thus if we should isolate the producer variation (in a sense, the "management" component) and consider it alone, we would see that the range in return for approximately two-thirds of the observations was $146 to $174 per $100 feed fed, considerably less than the corresponding range for the annual variation.

Finally, if each producer received, on the average, a return of $160, and if in each year the average return for all producers was $160, we would still have a variation of such magnitude that a range of $112 to $208 in return per $100 feed fed would be necessary in order to include two-thirds of the observations. Such large "unexplained" deviations may be due to such factors as errors in records, failure of level of management for a particular producer to remain consistent from year to year and, of course, the fact that the nature of the physical production process makes it impossible to predict with certainty the results of using any particular management practice. A trend in the level of efficiency during the ten-year period might also contribute to this type of variation.

One reason for the apparently small producer effect may be that the ten-year account keepers represent a much more homogeneous level of management skills than hog producers in general. Data are not available to test this hypothesis.[6] Nevertheless, the fact that the deviations, or "unexplained" differences, are large should invoke caution in making inferences concerning the magnitude of differences among producers from farm record data for a single year.

When we compare the standard deviation of the year effect (32) with

[6] A. G. Mueller found no significant differences in total farm efficiency measures between record-keeping (Farm Bureau Farm Management Service) farmers and those not belonging to the Service when farms were paired with respect to size and soil quality. He concludes ". . . given equal basic resources, managerial ability is not greatly different on record-keeping (Farm Bureau Farm Management Service) farms and survey (nonmember) farms." See Mueller, A. G., "Comparison of Farm Management Service Farms and a Random Sample of Farms in Western Illinois." *Journal of Farm Economics*, 36:285-292. May 1954.

the standard deviation of the producer effect (14), it might appear that the opportunities for high returns would be greater for those who were able to choose the "right" years than for those who adopted management practices associated with high returns.[7] This would be true, however, only if the high-profit years could be predicted with the same success as the increased returns presumed to be attainable by adoption of improved practices, and that sufficient flexibility were present to allow adjustments in volume of production.

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[7] For a discussion of these practices, see Mosher, M. L., *Livestock Earnings on North-Central Illinois Farms*, Bulletin 548, Illinois Agricultural Experiment Station, 1951. The practices include time of marketing, death losses after weaning, litter system, number of pigs weaned per litter, feed cost per 100 pounds hog produced, market weight, and other factors.

FACTORS AND FUNDAMENTALS

A RECENT trend in agricultural economics research to an emphasis of factor markets in search for causes of regional differences in agricultural incomes may have resulted in some unnecessary confusion. Bachmura[1] studied the labor and capital markets for an explanation of the persistent but dynamic regional differences in returns to Iowa farmers. He did not disclose the reasons for most of these observed differences. His recommendation for further investigation of the problem seems to be along the lines of the factor markets. This will be helpful but it will not lead, directly, to a satisfactory explanation of this oft-observed phenomenon.

I propose that future research into these differences in returns, be they regional or intraregional, include also a study of the response (physical and economic) of the land to the changing techniques of farm production. An essential phase of such study would be the response of land areas, and of the organization and operation of groups of farms, to changing demand for farm products. For example, as horses declined in numbers the demand for oats and for grass hay also diminished relative to other products. This has not had an equal impact upon all land areas nor on all groups of farms. Some farms have land, labor, and capital that permits easy change to more intensive or less intensive enterprises; others do not. Institutional arrangements and the factor markets are important in these changes, but are not exclusively responsible for the results that we observe.

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[1] Frank T. Bachmura, "Geographic Differences in Returns to Iowa Farmers: 1869-1950," *This Journal*, Vol. XXXVII, May, 1955, pp. 342-352.

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BOOK REVIEWS

America's Needs and Resources: A New Survey, J. Frederic Dewhurst and Associates, New York: The Twentieth Century Fund, 1955. Pp. xxix, 1148. $10.00.

This is an invaluable book. It might very well have been entitled, "The Saga of the American Economy—A True Story in Figures and Facts." No one even remotely interested in what our economy is, how it works, and what it achieves, can afford not to have it permanently within easy reach.

Although formally classified as a survey on economic activity in the United States and, like its predecessor of eight years ago, ranking as a standard reference book with accurate and specific data, this book has a highly dramatic and epic quality in the story it tells. These characteristics are primarily those of its historical subject with its drive and its sparkling vitality. That they have not been buried under the mass of detail and figures, but radiate from the more than 1,000 pages without the use of any evaluating nouns or adjectives, but simply by bringing into focus the proper dynamic features, is a tribute to the director of this large enterprise and his associates.

The subject of this economic survey is the struggle of the American people to improve by invention and organized work their level of living, and the actions and performance of a free society that has succeeded in lifting virtually all of its people to or above the status of an enormously broad middle class. What the automotive engineers achieve in part by means of transparent moving models to show the public the intricate operations of giant Diesel engines seems like child's play compared with what this book does. In accurate measurements it not only demonstrates the structural features of the complex economy, including its human, physical, and capital resources and its movements within the rotation of one year, but also produces a four-dimensional effect by showing the growth and internal change of the economy over time. The period of observation and measurement is anywhere from 50 to 100 years, and this is presented with masterly skill. The new volume is not only more comprehensive in scope than its pioneering predecessor, but measures the American economy's resources, productivity, and income and consumption pattern in the light of the enormous expansion since the end of World War II.

Credit for this proud achievement goes primarily to Dr. J. Frederic Dewhurst as Research Director and senior author who, with the aid of Thomas C. Fichandler, Associate Research Director, coordinated the work of a team of 25 well-known research associates, all of whom were competent specialists on subject areas. The contents are divided into five parts: basic trends; consumption requirements; capital requirements;

government and foreign transactions; and resources and capacities. These are followed by a summary in which Dr. Dewhurst weighs future needs against the resources. The 947 pages of text contain 352 tables and 105 diagrams, and are followed by 174 pages of appendices and an exhaustive analytical index. The contents of this encyclopedia will satisfy the most exacting demand for time series of accurate data, index figures, and other measurements of dynamic phenomena.

The agricultural economist will find—aside from most useful information on the process of development of the general economy and its gaining momentum during the last 15 years—an abundance of evidence on how closely food and fiber production and consumption are woven into the entire economic fabric. Of special interest to him are chapter 5 ("Food, Liquor, and Tobacco"), by Margaret G. Reid; chapter 6 ("Clothing, Accessories, and Personal Care"), by Helen M. Humes; chapter 7 ("Housing"), by A. Benjamin Handler, Lawrence N. Bloomberg, and Howard G. Brunsman; chapter 8 ("Household Operation"), by Gertrude S. Weiss; chapter 17 ("Land and Water Conservation and Development"), by Robert W. Hartley; and chapter 22 ("Agricultural Capacity"), by Louis H. Bean. Margaret Reid's chapter contains particularly useful time series on the consumption of major food groups for the period 1910-14 to 1951-52. Louis Bean's has an especially well-chosen array of strategic data showing how amazingly progress in the development of our agricultural capacity has kept pace with the growth of population and the growth of the economy as a whole.

In a sense most rewarding, because they contain a carefully distilled appraisal of the state of our economic affairs and a cautious look into the future, are the last three chapters on "Technology: Primary Resource," "Productivity: Key to Welfare," and the summary "Needs *vs.* Resources." These crowning chapters by Dewhurst are pervaded by the buoyant philosophy of the American economy and a subtle yet highly contagious optimism. This is far from the philosophy of gloom and doom and the theory of the "mature," stagnating economy and a culminating population so articulately voiced by certain economists in this country in the 1930's.

To quote only a few sentences: "Technology is an intangible factor in production, but it is in a very real sense the *primary* resource, for it determines the productivity of our tangible resources, or the efficiency with which they are used in creating useful goods and services" (p. 942). The last sentence of the text of the book: "Technology is our primary and inexhaustible resource" (p. 944). "It is this fabulous gain in productivity that enabled us in 1950 to turn out twenty-five times the volume of goods and services produced a century before, while the total 'input of labor,' as measured by the aggregate of man-hours worked, was less

than five times as large—127 billion man-hours compared with 27 billion" (p. 902). "That less than five times as much effort can produce twenty-five times the volume of goods and services means that output per man-hour in 1950 was almost six times what it was in 1850. This rapid increase in productivity, far surpassing that of any other great industrial nation, explains the vast material progress of the United States in the past. Productivity is the key to welfare—in America as in the rest of the world" (p. 902). In analyzing the factors that play a major part in this productivity, such as the input of energy and the capital investment per worker, Dewhurst deduces, from a study by the Machinery and Allied Products Institute, "that American agriculture is more 'capitalistic' than American business" (p. 911).

In the final chapter, Dr. Dewhurst estimates for the years 1950 and 1960 the "cost of establishing a floor for consumption without in any way disturbing the ceiling established by free choice within the economy." This appraisal of the leeway for further improvement at the bottom of the social pyramid arrives for 1960 at a difference of merely $500 million between estimated consumption and "need" for food measured by a high standard of adequacy. The total gap between expected demand or output and "needs," as measured by estimated gross national product, is given as 7 percent for 1960, compared with 17 per cent for 1950. In other words, the survey expects that the economy in its present setup and with its present dynamic course of further growth and expansion will, by 1960, pick up two-thirds of the "disparity," which in 1950 was estimated at $49 billion.

What these calculations make visible is the manageability of the proportions of socially desirable adjustments as well as the probability of extraordinary changes in the areas of technology and enlargement of resources. "What directions technological change will take is highly uncertain but that progress in the foreseeable future will be rapid—perhaps more rapid than in the past—seems beyond any reasonable doubt" (p. 944).

Even the scantiest selections from this mine would expand a review beyond the scope of a long article. In summary: a monumental work of masterful scholarship that represents, aside from its subject—the American economy—modern economics in the United States in admirable form. It would make an ideal gift to colleagues and scholars in other countries. It is highly suitable material for classes in agricultural economics and statistics, the only drawback being its price which, though very reasonable, is beyond the student's purse.

KARL BRANDT

Food Research Institute
Stanford University

Marketing Farm Products (Third Edition), Geoffrey S. Shepherd, Ames: Iowa State College Press, 1955. Pp. x, 497. $6.25.

The organization of this text follows the pattern of the previous edition to a substantial extent, with minor modifications and retitling of sections. There are three sections.

Section I deals with the delineation of major marketing problems and the framework of theory employed in analyzing such problems. Professor Shepherd has considered agricultural marketing to be separated into three major problem areas: (1) finding out specifically what the consumer wants, (2) accurately reflecting these wants of consumers back to producers via the pricing system, and (3) getting the goods from producer to consumer at the lowest cost permitted by existing technology. By drawing on a section relegated to the appendix in the second edition of this book, Professor Shepherd has focused attention in the new edition on the concept of the perfect market in time, space and form, as a guage against which the characteristics and performance of agricultural markets may be measured. In the interest of symmetry, the attribute of perfect competition in the market (or whatever competitive optimum the author accepts) might well have been added. Although an avowed shift away from the functional approach to marketing problems is made by use of the perfect market criteria and the commodity approach, advocates of instruction in marketing functions will not find this book too difficult to use as a secondary reference.

An innovation of Section II, dealing with over-all marketing problems, is the inclusion at the beginning of each of the major topics of a short chapter setting forth the elementary theory to be applied in succeeding chapters.

In line with Professor Shepherd's interest in pricing, a substantial portion (one-fifth) of the text is devoted to selected aspects of pricing in agriculture. In pursuit of the time, space and form aspects of the perfect market, the author deals first with temporal aspects in discussing cyclical and seasonal price movements, hedging, and the effects of future market speculations. The spatial characteristics of pricing are examined next in two chapters which deal mainly with the issue of decentralized versus centralized markets for livestock. A chapter dealing with grades and standardization rounds out the form aspect of pricing. In this chapter, the coverage of tobacco grading and market news appeared to the reviewer to be obsolete in some respects. For example, federal inspection and market news in tobacco now extends to some 170 auction markets, rather than the 117 to which the author refers.

In considering the extent of over-all marketing costs and specific techniques of reducing marketing costs, the possibilities of cooperatives are briefly considered and the author evaluates the impact of recent modifica-

tions in retail food merchandising, particularly the rise of the supermarkets and integrated chains, upon the proportion of the consumer's food dollar received by the farmer. Professor Shepherd apparently feels that the present trend in retail food distribution, if it continues, may ultimately provide systemic market efficiency only at the expense of becoming a public utility subject to public control rather than competitive self-regulation.

In the final section of his book, Professor Shepherd deals with commodity marketing problems, selecting the farm commodities for consideration on the basis of dollar value of sales. Although the commodity chapters are built largely upon materials contained in the earlier editions, the data have been revised and brought up-to-date wherever possible, and there are several modifications from the previous edition. A new chapter on demand and prices for livestock and meat now balances the emphasis on the problem of market cost reduction in livestock and meat. In like fashion, other commodity chapters also contain introductory statements relative to the demand and pricing aspects before considering marketing costs.

Recognition of the added importance of decisions relative to grain storage, and the effects of these decisions on net returns, is to be found in the second of two chapters dealing with grain marketing problems. It is regrettable from a pedagogic point of view, however, that this one instance represents the only place in the commodity marketing section where any of the perfect market criteria (in this instance with respect to time) so clearly defined in the earlier section are applied specifically to commodity marketing problems.

In the last chapter, dealing with the patterns of marketing progress, Professor Shepherd expresses the view that in general agricultural marketing has a good record, evolving new techniques and methods and placing them into practice with commendable rapidity. At the same time, he recognizes that continuous research and experimentation in agricultural marketing is needed to prevent ossification of the system in forms set by tradition and custom. With the latter conclusion, this reviewer would certainly agree.

The critical tone of the foregoing remarks may tend to convey the impression of inadequacy of this volume. Such is not the case. This is a good text in agricultural marketing for undergraduates. It is lucid and well written. The format is refreshing, the charts and illustrative materials are clear. As a class reference it will provide a source upon which elementary understanding of the problems of agricultural marketing can be built for the undergraduate.

ROBERT W. RUDD

University of Kentucky

The Economic Future of Canada, Dr. H. M. H. A. van der Valk. Toronto: McGraw-Hill Company of Canada Limited, 1954. Pp. xiv, 206. $4.75.

Tremendous economic changes have taken place in Canada during the last 10 years. Today Canada is the world's fourth largest industrial nation, and it is third in foreign trade. The Canadian population has increased 22% in the last decade, and this population is now 57.3% urban. That such economic and demographic changes should excite the curiosity of scholars is inevitable.

Dr. van der Valk has produced a stimulating and thought-provoking book which ought to be required reading for every USArian who is concerned about the political and economic future of our own country. In 1955 the United States Government will invest a reported $250,000,000 in the so-called DEW (Distant Early Warning) line alone. As Dr. van der Valk so well demonstrates, the political and economic future of the United States and Canada are inextricably and inexorably interwoven. Such a situation demands appreciation of mutual obligations, privileges, and responsibilities on the part of a thoughtful citizenry motivated by mutual respect.

Dr. van der Valk has rendered a valuable and lucid analysis of his beliefs about the economic future of Canada. His coverage of the economic and social factors is typical of the uniformly high standards we expect from European scholars. His careful definitions and insistence on economic theories may, to some readers, seem a bit pedantic. In my opinion, they typically add substance to his observations and opinions.

In this book he has not produced anything essentially new to anyone even casually informed about the Canadian commonwealth. He has marshalled much economic information and brought it into focus. He has looked at available data with refreshingly different conceptual insights, as, for instance, his acutely accurate observations of the "five-day week" (cf. footnote, p. 169). He has provided a set of value-judgments for benchmark purposes. He has projected historical and current data into "future expectations" for the next few decades. USArian farmers and businessmen need especially to read the chapters dealing with "The Rapid Development of Natural Resources," "Transportation," and "Economic Growth in the Next Few Decades." The factors at work in these areas will in all probability affect many individual enterprises in the United States.

Dr. van der Valk quotes Professor S. D. Clark: ". . . In Canada, however, in a way that has not been as true of the United States, various influences of a political, cultural, and religious character have served to check the free play of economic forces and as a result to limit economic growth. Rigidities have entered into the development of the Canadian community which have had the effect of diverting the resources of the country and the energies of the people into channels of advantage to non-

economic interests. . . ." Dr. van der Valk observes on the future of this issue: ". . . The question is whether this spirit of materialism will grow. Increased industrialization creates a danger in this respect. Prospects depend in part on the influence which the churches can develop and on whether the European culture can be maintained or even be strengthened."

On the projection of future trends it seems to me that Dr. van der Valk is unduly influenced if not handicapped by his European backgrounds. Thus I believe that he is inclined to project past experiences in an almost timid manner. I do not believe that Dr. van der Valk has given sufficient weight to what we USArians glibly call the "dynamic aspects" of our business civilization. This particular propensity is perhaps most easily demonstrated in Dr. van der Valk's population forecasts which give 196? as 17,000,000 and 197? as 23,000,000. Presumably the particular years are 1963-64 and 1973-74. In a footnote Dr. van der Valk emphasizes that a population expert wrote in 1947: "The latest official calculation gives estimates for 1971 ranging between 13,917,000 and 14,606,000 people." The latter figure was reached in 1953, 18 years earlier than estimated, and the current figure (March, 1955) is 15,482,000. At the current rate of growth a population of 19,186,000 is now suggested for 1963-64. It seems to me that only a war or other similar disaster would change the growth trend of the current decade, one fifth of which already has elapsed. It may be that the mobility factor of a business civilization accounts in part for this population increase.

It is perhaps fortunate that actual growth is not determined by population experts or economists. Dr. van der Valk's book is studded with evidences of agricultural, business, and government pioneers who not only are moving the physical "frontier" of living northwards but who also are extending the frontiers of human aspirations and knowledges. It is primarily this group of energetic people, blessed with imaginative foresight and almost stubborn determination, who will influence the growth potential above the forty-ninth parallel.

BEN A. LINDBERG

University of Alberta

Demand for Meat, Elmer J. Working, Institute of Meat Packaging, The University of Chicago, Chicago: The University of Chicago Press, 1954. Pp. 136. $1.00.

This monograph summarizes an attempt to wrest from annual data on prices, quantities, incomes and price levels, information concerning the over-all demand for meat, the demand for beef and the demand for pork. Data for the interwar years were analyzed, and the results are presumably to be used in making postwar policy for the meat industry.

The principal policy implications of the findings are presented in a "highlights" prelude to the study. The most important finding is stated to be evidence indicating that the demand for meat is more elastic in the long run than in the short run. In the study proper there are seven chapters, the first four of which deal with the outstanding facts of the situation, measurements of demand, the basic data, and the demand for all meats. The last two chapters discuss demand for pork, and demand for beef. Chapter five compares postwar data with the findings of the analyses of the interwar years.

There are forty-five pages of appendices, thirty-three of which are devoted to the results of correlation analyses. Estimates of the parameters of a three equation simultaneous equation model are also presented. A two-page bibliography completes the work.

A modification of multiple regression analysis is used to estimate the parameters of the various models. Dr. Working is well aware of the failure of the data to meet the assumptions of the multiple regression technique. He mentions correlated errors and errors in the independent variables as potential sources of difficulty, and uses averages of converted regression coefficients rather than the usual least-squares estimators for the parameters of his models.

The author is cognizant, also, of the very high probability of specification error encountered when one uses the relatively simple single equation multiple regression model in working with data likely to have been generated by a rather complicated structure. Dr. Working mentions simultaneous relationships, omitted variables, and changes in the structure itself as possible sources of specification error. He also specifically states that, in the presence of all these doubts about the validity of the technique being used, the "t" ratios and the extremely high values of the multiple correlation coefficients are to be interpreted cautiously. No one could, therefore, accuse the author of an off-handed choice of his technique of analysis.

There remain, however, some methodological problems that are not overtly discussed in the monograph. A large number of the models presented in the text and in the appendix are compatible with the data. How is the reader to choose one of these models to derive theorems upon which to base policy actions? It is almost a foregone conclusion, too, that some of the models were suggested by intensive study of preceding models and thus of the data in hand. How should the theorems of models built in this way be tested? It would seem that new data are needed to test these theorems. Unfortunately the only new data are those of the war and postwar years, which, in general, are not compatible with the theorems derived from models whose parameters have been estimated from data of the interwar years.

Some mention might have been made of the sampling distributions of

the averages of converted regression coefficients. What desirable properties are possessed by estimates so obtained? Does the use of these estimators overcome some of the difficulties encountered in the use of annual averages? Are any new difficulties introduced?

Dr. Working seems to single out the first equation of set 8a as a model which indicates the difference in short and long run elasticity of demand. This equation reads

$$P = b_o(Q)^{b_1}\left(\frac{100q}{Q}\right)^{b_2}(I)^{b_3}\left(\frac{100c}{C}\right)^{b_4}$$

Where,

P = Index of deflated price for given year (1935-39 = 100)

Q = Average per capita consumption of preceding ten years

q = Per capita consumption of given year

I = Index of deflated disposable income per capita for given year (1935-39 = 100)

c = Consumers price index for given year

C = Average of consumers price index for preceding 5 years.

It is stated that an estimate of long run demand elasticity is given by $1/b_1$ and of short run demand elasticity by $1/b_2$. As b_1 is absolutely smaller than b_2, long run demand is thus estimated to be more elastic than short run demand.

It was at this point that the reviewer felt most strongly the wish that some of the space allocated to the presentation of correlation results had been devoted instead to a theoretical and methodological appendix. He (the reviewer) is unable independently to determine the theoretical considerations that led the author to use these estimates.

Two points are focal:

1) The idea that a long run demand curve can be estimated from the net regression of the yearly index of deflated price on the average per capita consumption of the preceding ten years does not possess strong intuitive appeal.

2) The author implies that

$$\frac{\partial P}{\partial Q} \cdot \frac{Q}{P} = b_1$$

To the reviewer it seems that

$$\frac{\partial P}{\partial Q} \cdot \frac{Q}{P} = b_1 - b_2$$

The reviewer is rather diffident about suggesting that the principal conclusion of the study is not demonstrable within the framework of the published results. Indeed, such action verges on the foolhardy. A technical appendix as suggested above might have permitted the reviewer to avoid this conclusion. Based on his own theorizing, however, the reviewer must retain serious doubts as to the validity of the author's conclusion.

Given the author's own reservations about the data and techniques used (which reservations are rather widely held), one is moved to wonder if it would not be better to expend the energy involved in the intricate, detailed analysis of annual market data herein presented upon the collection and analysis of new data. It might be possible, with the expenditure of comparable time, energy and money to obtain data about the analysis on which it would be unnecessary to entertain such serious reservations. Is it reasonable to assume that in a time of rather severe social and economic changes, parameters such as the elasticity of the demand for meat remain constant? Given that this parameter was constant in the interwar period, is it reasonable to assume that it is the same constant in the postwar years? Perhaps annual data should be used in descriptive studies while the intensive analytical efforts displayed in this monograph would be reserved for more worthy data.

WILLIAM G. O'REGAN

University of Florida

Marketing of Agricultural Products, Richard L. Kohls, New York: Macmillan, 1955. Pp. xiii, 399. $5.25.

In the preface, Dr. Kohls, indicates that any marketing professor "worth his salt" will plan to use supplementary material particularly suited to the students he is working with regardless of the text book. This is probably the reason he kept this text shorter than any other in the field. The writing is on an elementary level suited to sophomore students in agriculture.

The book is divided into three major parts. Part I, "The Framework of the Marketing Problem," as the title implies tries to provide an orientation to the marketing process. This is done by means of a brief historical background of marketing, definition of some marketing terms, and description of producers and consumers served by agricultural markets in this country. There are 82 pages in this part or about 20% of the book. Part II, "Some Functional Problems," includes four chapters on agricultural prices, including one chapter on government price policy and marketing programs, plus a chapter each on: "Standardization and Grading," "Collection and Use of Market Information," "Transportation," "Storage," and "Risk and The Futures Exchanges." There are 135 pages in this part, or about 35% of the text. Part III, "Commodity and Institutional Problems," as may be inferred from the title, considers a group of miscellaneous topics which don't fit in the previous two parts. The first six chapters describe the market for separate agricultural products. The remaining five chapters are concerned with: agricultural co-ops, governmental regulation, food processing industries, wholesaling and retailing of food, and a summary. There are 170 pages in this part or about 45% of the book.

There are tweny-five chapters in the book. The average length is a little over fifteen pages. A hurried check indicated that most of the varia-

tion in chapter length might be attributed to variation in the number of tables and charts presented. It appears that the aim was to have ten pages of text plus such illustrative tables or charts as seemed appropriate. The style of writing is clear and direct. Important points are repeated in subsequent paragraphs for added emphasis.

In the preface, Dr. Kohls recognizes the need to write a text in such a way that marketing will not be a "stuffy, dry area of study." He has attempted to do this by continued reference to objects that are familiar to students such as ". . . hogs, milk, the retail food store, and so on." It is good to see this problem recognized, but in the judgment of this reviewer it takes more than frequent reference to familiar facts and institutions to make a book really interesting to students. This book is primarily descriptive. Perhaps the description would be more interesting if the controversial issues making the facts important were developed in advance of the facts. It is also possible that a more penetrating discussion of the problems treated (probably requiring a longer book) would give students a better appreciation of the importance of these problems.

This text, like most others in the field of marketing, develops only the most elementary of economic theory. Presumably theory is a tool that is of value in the analysis of problems. On this presumption one might expect the theory section to be placed very early in a text and *used* thereafter to clarify problems under discussion. This reviewer is inclined to think that the theory section in this book is not introduced early enough and that much of the remaining discussion would be improved through proper application of economic theory. Some improper implications of theory appear in this book. For example, in discussing the concept of perfect competition, Dr. Kohls says flatly that under this assumption "businesses will operate at their optimum size, neither smaller nor larger." No reference is made here to the necessary corollary assumption that economies of scale are exhausted before the number of sellers is reduced below that required for perfect competition. In an earlier section of the book he says that "economic efficiency is concerned with maintaining the competitive aspects of marketing." Along the same line Dr. Kohls appears to be over-impressed with the power of the consumer in our markets. He says, ". . . in a very real sense in the long run, he who serves the consumer best profits most." Perhaps Mr. J. B. Duke was treated unfairly under the anti-trust laws.

The book also reflects in its pages some of the current confusion among agricultural economists. For example it is recognized that the supply response to price is a tenuous one. On the other hand flexible price supports are defended on the basis of their superior effect in guiding future production. Also, in discussing federal orders for milk and their part in discriminative marketing of fluid milk the statement is made that most

studies have found the demand for fluid milk to be inelastic. However, Dr. Kohls seemingly concludes that high price policies in these markets have reduced the returns from Class I sales. All this is evidence of the necessity of agricultural economists to do a great deal more research on producers' responses and consumers' responses.

Some important marketing issues are grossly neglected. For example, there is no section of the book on trade barriers. This issue is mentioned in several places in connection with other subjects, but in this reviewers judgment it is important enough to warrant separate treatment. The question of co-op taxation is given only one paragraph in a one and one quarter page section on co-op relations with the general public. Again in this reviewer's opinion this subject warrants more attention.

The text is well documented and a list of selected references is given at the end of each chapter. The referencs used are up-to-date. They are not intended to form a complete bibliography, but rather, as a source of additional detail for the subjects summarized in the text.

The text will appeal to some for its brevity and the opportunity it gives for a teacher to develop his own course. The need for supplementary reading material with every chapter will be considered a severe handicap by others.

EDWARD H. WARD

Montana State College

Freedom in Agricultural Education, Charles M. Hardin, Chicago: University of Chicago Press, 1955. Pp. xvii, 275. $4.50.

This book stems from the question: "Have federal grants to the states for agricultural research and extension been accompanied by federal control of personnel and policy? The answer obviously was of interest to the Commission on Financing Higher Education, whose executive director, John Millet, raised the question and writes the foreword.

Professor Charles Hardin has broadened the scope of the inquiry to include the effect of political pressures from whatever source affecting agricultural research and extension, as well as the influence of political interests in themselves. The result is an interesting little book, interspersed with bits of gossip, but forebearing to gossip unless it is reasonably essential to the central theme and problem being analyzed.

The first two chapters discuss the political significance of agricultural research and extension, with a historical sketch of controversial agricultural issues. Chapter III discusses the federal grants-in-aid program, while Chapter IV discusses the controversy over these grants with Pennsylvania State College in 1940-42. The next two chapters discuss the political influence of agricultural action agencies, with details of the Kentucky low-nicotine tobacco controversy.

Chapters VII through XI discuss within-state politics as they affect the land-grant colleges and the colleges of agriculture. Here Hardin considers the colleges themselves as political forces. The margarine controversy at Iowa State College is developed as a case study of intrastate politics, while numerous other frictions elsewhere are noted. Chapter XII deals with the Association of Land-Grant Colleges, with emphasis upon its usually slow and conservative recognition of the problems facing agriculture. Some quotations suggest an unbelievable disregard of the 1931 economic situation and a general unwillingness to develop a public policy position, except for the period 1944-48.

The next three chapters deal with the BAE, with emphasis on 1940 to 1953, and the attrition so well reported in Hardin's "The BAE Under Fire."[1] The next chapter deals with public policy programs in extension, followed by a summary chapter.

Hardin concludes that federal grants have been a source of strength to the states rather than a means of federal control. Institutional leaders have been willing to take a strong position because (1) some funds would accrue from federal sources in undiminished volume, (2) they could argue that certain changes would not be acceptable at the federal level, and (3) they as individuals could anticipate a federal job if their state position became untenable.

The conclusion corollary to this is that political pressures within a state have sometimes been severe. Hardin points out how the governing boards of several of the land grant institutions were in turn made more subservient or less susceptible to internal political pressures, with some gradually developing a substantial independence. It is well to realize that the present level of academic freedom in most land grant institutions was not reached without much struggle and fighting for principles. The inference is clear that the new generation likewise must fight to maintain the present freedoms and to extend them in new directions.

Similarly Hardin points out how the BAE has been subject to ebbs and flows in its relations to Congress and in the amount of freedom it has had for carrying on independent economic investigations.

Throughout the book he is concerned with techniques by which the state and federal agricultural institutions can accommodate to political realities, but still insulate themselves from the most serious disrupting effects that sometimes follow. He is concerned that public policy extension and programmatic research be developed to meet today's challenges, and not be scuttled in a fruitless effort to avoid controversy either at the federal or the state level. He appears to consider that such research is more difficult to maintain and to protect at the federal level

[1] Charles M. Hardin, "The Bureau of Agricultural Economics Under Fire: A Study in Valuation Conflicts," *this Journal*, Vol. XXVIII, No. 3 (August 1946), pp. 635-68.

on a continuing basis, but also difficult to do at the state level because of the more limited budgets and distance from sources of necessary data and information.

Hardin appears to assume that the colleges of agriculture in general have been led by men well able to cope with practical politics. However the discussion of the Land Grant College Association and elsewhere suggests that too much insulation and too slow an adjustment to current problems is also a weakness. In the last few pages (200-204) he discusses the conservatism of college administrations. It may be that some of the college problems of the last two decades stem from too much insulation from the world of reality, and from long-delayed budget reallocations. Hardin, however, is less concerned with this side of the coin.

One brief comment is in order about the make-up of the book. Apparently it was published through a photo-offset process from a manuscript typed by an electric typewriter. The print is quite readable, though not quite as elegant as a normal type-set page. With 62 pages of footnotes following page 204, and separated from the text proper, it is unlikely that more than a handful of readers will take account of them. They do provide a useful bibliography beyond the acquaintance of most readers of *this Journal.*

LAWRENCE W. WITT

Michigan State University

The Economic Theory of Agricultural Production, Lauri O. af Heurlin, Helsinki, Finland: Suomalaisen Tiedeakatemian Toimituksia, Annales Academiae Scientiarum Fennicae, Sarja-ser B nide-tom 87, 1, 1954. Pp. 130. 450 mk.

The title, although attractive and provocative, is a misnomer. Rather than *The Economic Theory of Agricultural Production,* the title more appropriately should have been *Some Geometric Tools for Analyzing Land Rent.* Within the confines of such a limited title, the book merits the attention of those who are still sufficiently influenced by the history of economic doctrine to be interested in the analysis of land rent, a burning question for our professional forebears.

The theory of rent, in recent years, has not received intensive analysis. The contemporary position is well exemplified by the attention given to it in *A Survey of Contemporary Economics,* where in the chapter on Value and Distribution Haley devotes less than a full page to Theory of Rent. His first of three paragraphs includes "The theory of rent has played a very small part indeed in recent theoretical discussions. . . . The fires that burned so hotly have about died out." Rather than rekindling the fires, Heurlin devotes his energy to the erection of geometric scaffolds on which he briefly rests and fans a few glowing embers.

For a definition of "rent," Heurlin writes, "the difference between the price of the product and its non-rental expenses, divided by the area of the land used, will here be called the rent of the land in question, expressed in terms of money per unit of area." With this definition at hand, graphical measurement of land rent is explained for various conditions of production, including fixed technical coefficients as well as cases of continuous, limited, and diminishing substitutability among the variable productive services.

Heurlin emphasizes the "principle of two-dimensional quality of land," inherent fertility and exploitability. Intermittently, he comments briefly upon the traditional problems associated with land rent, including the order of cultivation, location of land, rent as a cost factor, and cultivation of different lands; but his major objective is the geometric measurement of rent. Of interest, in terms of the extent to which two-dimension graphics can be exploited, is his geometric analysis of cultivating two commodities on a single area of land and then the comparative suitability of two areas of land in the cultivation of two products.

Aside from a ponderous and uninteresting style of exposition, the volume's weakness lies in its narrow outlook. The rent concept is not analyzed thoroughly nor its position in distribution theory. Attention is given to Ricardian differential rent, but no mention is made of the Walrasian concept of rent nor the Paretian, the surplus return that a productive service earns in a particular industry over and above its opportunity cost, the rent concept widely accepted now. Primary attention is devoted to static equilibrium rather than the workings of a dynamic economy yielding profits that in due time are shared as rent by the productive services able to extract it through bargaining.

With the growing attention to the economics of "underdeveloped" areas, in which land rent and functional distribution are significant problems, one may see a rebirth of interest in the theory of rent where some unsettled questions still remain. In such an event, Heurlin's study may suggest some novel geometric tools rather than provide an engine of inquiry.

SIDNEY HOOS

University of California

Sugar Beets in the USSR: Selection and Seedbreeding (In Russian, with summaries in English, French, and German), Alexander Arkhimovich, Munich (Germany), 1954. Pp. 176.

The study under review, by Professor Arkhimovich, is one of the publications in the series of research and materials published by the *Insti-*

tute for the Study of the History and Culture of the USSR, organized in Germany by new emigrants from the Soviet Union.

The interest of this study, as well as of some others in the fields of economics and agriculture of the same series, is based on the fact that it is prepared by a specialist who for more than two decades was connected with the activities of the Soviet research and teaching institutions, assisting in the reorganization of the Soviet agriculture on the collectivist principles. Testimony of such a specialist, very well informed on the development of the Soviet agriculture, upon one of its principal branches, particularly in the Ukraine, should be of special interest for agricultural economists in this country, handicapped by the paucity of reliable information on Soviet agriculture.

The study is divided into four parts: Part I covers the history of selection of sugar beets in pre-revolutionary Russia and in the USSR (pp. 9-34); Part II supplies a concise characterization of beets as an object of selection (pp. 35-54); Part III—the largest—discusses methods, techniques and results of the selection of sugar beets in the USSR (pp. 53-103); and, finally, Part IV describes sugar-beet-seed production in the USSR, its methods and organization (pp. 104-135).

In addition to this the author supplies a very complete bibliography on the subject, including a list of specialized Soviet periodicals, works and proceedings of scientific congresses and conferences, as well as studies by individual specialists, including articles published in the Soviet periodicals. This bibliography, covering 422 titles on 26 pages, is particularly valuable for specialists in genetics, since it greatly facilitates the finding of specialized studies in not easily accessible Soviet periodicals and reports.

As appears from the above, the book will be of major interest for American geneticists. However, it presents considerable interest also for agricultural economists, particularly Parts I and IV. From Part I, for instance, they may learn, perhaps to their surprise, that selection of sugar beets was on a fairly high level in the special selection stations of private enterprises of the pre-revolutionary sugar industry of the Ukraine. They will learn also that only in the new regions of sugar-beet cultivation (in the European East and in Asia) has the Soviet Government added new experiment and selection stations for sugar beet. In the traditional sugar-beet area of the Ukraine the number of experimental and selection stations for sugar beets was reduced rather than increased.

This specialized study may also help the reader to understand the particular handicaps that retard application of various scientific achievements of the Soviet scientists, which are described by the author in various places in his book.

It must be stated as criticism that there are many misprints in the book, perhaps because it is published in a country where Slavic languages are unfamiliar.

V. P. TIMOSHENKO

Food Research Institute
Stanford University

Milk Control Programs of the Northeastern States, Part I Fixing of Prices Paid and Charged by Dealers, Leland Spencer and S. Kent Christensen, Ithaca, Northeast Regional Publication No. 21, Cornell Experiment Station Bulletin 908, November 1954. Pp. 136.

This monograph-length bulletin is the product of active research in five northeastern states and is sponsored by the Northeastern Dairy Marketing Technical Committee. It makes a comparative appraisal of the effects of the price fixing features of existing milk control programs in 10 northeastern states, including Virginia. Such programs also exist in four southeastern and three western states.

Basic state legislation authorizes fixing producer pay prices in the 10 northeastern states and fixing of dealers resale prices in seven of these. During the 1930's emergency legislation of this kind existed in nearly half the United States.

This study is especially timely at a period when there is perhaps more unrest among dairy producers and dealers than at any time since the late 1930's. State milk control is again being sought in a number of midwestern states (and doubtless in others) for its use in fixing margins as a defense against competition. Perhaps the dealers find producer unrest a convenient front for this movement back to state milk control.

Producers are restless over sagging milk prices, which they find especially hard to understand when the economy as a whole is keyed to a high pitch. Dealers find that technological change—such as paper packages, short-time pasteurizers, quantity containers, venders, homogenizers, bulk procurement and so on—requires constant investment outlays to stay in the market with those who use this new technology as a vehicle for competition. It is well known that dealers hesitate to cut prices of conventional products, in conventional container sizes with the conventional services. For example, few will cut the price of the glass packaged, home delivered quart of milk. Yet in the drive for volume, dealers will put out a gallon container for sale to stores, declare it costs less and cut the price to levels that are deadly to competitors. All manner of discounts are given—many secret and discriminatory.

The authors of this study suggest a number of ways to improve the operation of the state milk control programs, many of which suggestions

they have borrowed from the experience of operation under federal orders.

Among the most interesting conclusions are that the state and federal milk control programs in the northeastern states have brought somewhat higher prices to producers and have stimulated production. They estimate an increased gross return to producers of 21½ cents a hundredweight, a curtailment of fluid sales of 1½ per cent, and increases in production of about 5 per cent. They estimate that the latter changes reduced the net blended return by 5 cents a hundredweight, leaving a net gain of 16½ cents or about 5 per cent. They do not try to appraise the separate effects of state and federal programs.

The authors say they doubt that control of dealers' buying prices should be attempted or continued where the foundations of successful enforcement are weak. Evidence is shown that these foundations often are weak.

As to margins the authors conclude that prices charged consumers for single quarts of milk delivered to homes in regulated markets are not significantly different from what they would be if there were no resale price fixing. But they say it is very probable that prices charged for milk sold on a cash and carry basis at stores would be one or two cents less, if not regulated. Also state milk control agencies often have required extra charges for paper packaged milk. And the resale price fixing has tended to prevent quantity discounts.

With the nature of competition in the industry as it is, all this adds up to wider margins than would otherwise prevail, unusual pricing rigidities and a lessening of competitive pressure to adopt cost-saving practices. These things the authors tactfully admit.

The authors question the assumption that fixing of resale prices is necessary to stabilize producer prices. The bulletin concludes with an expression of doubt that, from the viewpoint of the public interest, the benefits of resale price fixing equal or outweigh the disadvantages. They recommend the adoption of suitable alternative measures to deal with the problems of resale pricing.

Research findings and beliefs among agricultural economists would support much of what is concluded here. One could wish that the findings were not so tactfully hidden in the plethora of words. This is partly excused by the fact that the subject is one on which feelings run high and political pressures are strong.

One also wishes that consideration had been given to some things not mentioned in the study and that further attention had been paid to some things on which they touched lightly. In this study there is the same lack of consideration, as elsewhere in the literature, for the dairy pro-

gram as a whole; the same tendency to treat it a segment at the time. Perhaps those who concern themselves with the effects of federal price support programs should be more concerned with milk control orders. If the general level of farm milk prices is to be upheld by supports on product prices, then it is less desirable to use agreements as a device for increasing average farm returns, and vice versa.

No attention is given to the restrictive effects that the administration of these state laws may have on imports from outside the respective states, for example from the middlewest, where presumably milk can be produced more cheaply. If, as the authors say, producer prices in the long-run averaged more than they would have without control, this must mean that milk from other areas was kept out of the markets.

Almost nothing is said about the possible effect of the orders on price expectations and consequently on production. Some researchers have argued that farmers produce more milk than they willingly would produce at the same prices without the orders. This differs from the findings of the study under review that prices have been higher under the orders.

Further consideration might have been given to the effects on technological innovation, the separate effects of federal as opposed to state orders, the actual advantages of pricing without formulas and the alternatives to state milk control laws.

Whatever its limitations, this is the most comprehensive evaluation of state milk control laws yet made, drawing as it does on a wealth of experience of its several participants. Careful studies such as this will be useful wherever state milk control is considered.

HUGH L. COOK

University of Wisconsin

The Story of FAO, Gove Hambidge, New York: D. Van Nostrand Company, Inc., 1955. Pp. xii, 303. $6.50.

There are probably very few people who can match the qualifications of the author for writing this *Story*. A former journalist and writer, Gove Hambidge has not only been with FAO from its inception to the present, but also constitutes part of its story. However, owing to this very intimacy of assocation he inevitably labors under certain disadvantages. Although he undoubtedly is acquainted with the full story, there are many important aspects he inevitably omits or sloughs over. This tendency to telescope the critical turning points in the life of the organization may perhaps be born out of fear to embarrass FAO or some of its past and present officials, and/or out of a possible lack of detachment bred by the very closeness to the events that are unfolded. Thus, the book is handicapped by being the more or less official story without

really meeting the requirements of a detailed and fully documented official history.

Hambidge divides his book into three Parts. Part I sets the stage and presents the challenge facing FAO by graphically depicting the contrasts in the type of farming practice and the standards of rural welfare experienced by a farm family in an underdeveloped area such as Egypt and a highly developed country such as the United States. Part II traces the birth and growth of the organization, while Part III describes in great detail its major activity—technical assistance. The most interesting and in a sense the central core of the whole account is Part II; it is here that the origins of the FAO "idea" and the influences that shaped it are discussed. At the same time, the issues and problems faced by the organization since its inception are touched upon. Unfortunately, however, most of this seems to be brought out only in passing, while well over half of the book is devoted to a dull and tedious enumeration of a host of individual technical assistance projects country by country, without any real attempt to draw upon this wealth of experience for an appraisal of the impact and effectiveness of the assistance rendered. For instance, one looks in vain for an exploration of such problems (a) as the degree to which technical assistance is able to overcome institutional and cultural resistance to technological advance and innovation in agriculture; (b) whether or not an international extension program really penetrates to the grass roots, i.e., whether its impact is confined to the few or spreads out to the many; (c) the degree to which the impact of technical assistance is durable or self-sustaining; and (d) whether or not the agricultural technology imported is not only technically, but also institutionally and economically appropriate to the conditions found in the recipient country.

A number of other basic considerations concerning the whole technical assistance approach are more or less passed over. For example, what was the original reception of the technical assistance idea in the underdeveloped countries? Has there been any noticable change in the attitude of these countries under the impact of technical assistance in being? How readily is technical assistance accepted when it is divorced from financial assistance? In any case, regardless of the question of acceptance, to what extent, if any, is the application of technical assistance limited by the lack of financial assistance? On the basis of FAO's experience, what problems does the loose coordination of a multiplicity of technical assistance programs present? Was the conception of a highly decentralized system, with essential program control vested in the different specialized agencies rather than the United Nations itself, sound?

However, technical assistance represents only one, though unquestion-

ably the most important phase of FAO's work. Yet, prior to the inauguration of ETAP (Expanded Technical Assistance Program) in 1950, only a comparatively small share of the organization's resources and personnel were devoted to this activity. Therefore, for an understanding of FAO's origins and the course of its development we must return to the subject matter of Part II and deal with certain aspects of the story not covered by Hambidge.

The foundation for international cooperation in the field of food and agriculture was laid by the League of Nations and the International Institute of Agriculture, before World War II. Under the combined impact (a) of advances in nutrition; (b) of a growing awareness of widespread malnutrition engendered by poverty and declining standards of living; and (c) of accumulation of agricultural surpluses, a group centered in and around the Health section of the League secretariat proposed a "marriage of health and agriculture." The primary impetus for this movement in the '30's came from nutritionists rather than economists, even though it dovetailed with the various international commodity stabilization schemes widely discussed at the time. Perhaps the most important aspect about all of this is that this whole program had a marked policy orientation and action bias. In this respect it contrasted sharply with the activities of the International Institute of Agriculture, which was primarily a fact gathering agency. Thus the very process by which and through which the FAO idea evolved was based on a conflict between the advocates of a pronounced policy and action orientation and those who wanted to confine the organization to a statistical and technical advisory role.

This conflict was already quite apparent at Hot Springs and has plagued the organization ever since. In a sense, it was closely linked to the more general question of how far governments are willing to go in delegating certain aspects of decision making to an international body. Most of the major issues facing FAO, such as the World Food Board plan and the other international commodity stabilization schemes, all stumbled partly upon this rock. This need not have been a particularly critical problem if the leadership of the organization had not committed itself to the action approach. Having committed itself and being frustrated in its efforts, the organization was floundering and groping for a focus between 1947 and 1949, when it was rescued by technical assistance, which gave it a concrete and meaningful task and a new *raison d'être*. This problem was especially acute since the leadership in the organization failed to understand and appreciate the place and importance of policy oriented research in an international setting. It was so preoccupied with being frustrated by its inability to obtain sufficient scope for action, that it had no energies left for developing a research

program of high caliber that by virtue of its quality would command a hearing and authority. However, in all fairness to FAO, it should be pointed out that this problem was common to all United Nations agencies in their first years, with the singular exception of the Economic Commission for Europe.

Probably the most important single issue confronting FAO from its very inception was the problem of agricultural surpluses, buffer stocks, and international commodity stabilization. A variety of schemes have been proposed and considered, the most dramatic being that for a World Food Board laid before the Copenhagen Conference of 1946 by Sir John Boyd Orr. This as well as all other proposals were rejected for a variety of reasons that limitations of space do not permit us to analyze. However, FAO deserves credit for keeping this issue alive for the time if and when economic conditions and the attitude of governments should prove ripe for their implementation.

This reviewer has dwelt upon the weaknesses of Hambridge's *Story* and upon some of the issues that he feels should have been discussed at greater length. However, this is not meant to obscure the great value of this book as a first and basic account of the major postwar experiment in intergovernmental cooperation in the fields of agriculture, forestry, and fisheries.

ALEXANDER ECKSTEIN

Russian Research Center
Harvard University

American Agriculture: Its Structure and Place in the Economy, Ronald L. Mighell, New York: John Wiley & Sons, Inc., 1955. Pp. xii, 187. $5.00.

Mr. Mighell describes American agriculture in a style that should appeal to many readers. The problematic framework in which much of the description is presented makes the book especially useful to the lay reader who is interested in gaining a better understanding of American agriculture and its problems.

Addressed to readers who are not necessarily professional agricultural specialists, its purpose is to present in ordinary words a picture of the structure of agriculture, of its separate parts, of how these parts are integrated, and of how the whole fits into the economy of the Nation. Mighell's concept of "ordinary words" may be slightly different from that of the lay reader, but the book is well organized and its meaning easy to understand.

The book is based primarily on census data, although the author has made extensive use of other studies in an effort to supplement and interpret the mass of data presented. The material is presented in a way that helps the reader to gain a vivid impression of the changes that have taken place, the trends that are evident, the present position of agri-

culture and its relation to the rest of the economy, and the problems that are current. His choice of examples adds interest as well as understanding to his writing.

Mighell deals with the changes in farm production since 1900, emphasizes the importance of changing technology, indicates trends in eating habits and cites the needs for further adjustments. He follows this with a chapter on agriculture in the total economic process in which he emphasizes the transfer over time of many functions from the farm to the non-farm sector of the economy. These fall into two broad categories, prefarm and post farm. The manufacture of machinery, fertilizer, and insecticides are cited as examples of the former, and processing and other marketing functions as examples of the latter.

Approximately one-half of the book is devoted to a description of American farms including labor, land, capital, technology, scale, type, tenure, credit, and part-time and residential farms. A separate chapter is devoted to group interest in agriculture. Here Mighell deals with farm organizations, farmer cooperatives, and government as they relate to agriculture. Another chapter deals with social features of the structure of agriculture. Here the level of living of farm people is presented and compared with other groups. Differences are noted and problems are pointed out.

The final chapter deals with change and structural strain. Here Mighell attempts "to appraise the stresses and strains, the pressure points, and the tensions that beset agriculture." For example, he says "One of the greatest forms of strain in the whole business structure of agriculture is related to the task of synchronization between the separated areas of decision-making with respect to the direction of production and the use of resources." Other points stressed are technology and social decision, mobility and transfer of resources, political roadblocks and flexible linkage, risk, education, health, non-commercial farming, and the conservation of human resources.

Mighell has done a good job. His book will not only be useful to the lay reader interested in understanding agriculture and its problems, but it will be a worth-while reference for the agricultural economist.

H. BROOKS JAMES

North Carolina State College

Managing the Farm Business, Raymond R. Beneke, New York: John Wiley and Sons, Inc., 1955. Pp. vii, 464. $3.96.

To those of us who have the responsibility of teaching beginning farm management to a large number of undergraduates each year, the announcement of a new text in farm management gives rise to new hope, although in too many cases it is short-lived. Probably it is expecting too

much to find in a text written by some other person the exact organization and the amount of principle, illustration and rigor that one desires. No two individuals think that much alike.

Beneke's book is intended for "students in vocational agriculture in secondary schools and for students in junior colleges and agricultural institutes." He has done a remarkable job of writing for students at this level. By focusing on decisions, he is able to bring in the relevant economic principles and give them meaning in terms of the problem at hand. This is in contrast with the custom of placing the principles in a separate chapter after which the author forgets them and relies on judgement, intuition, custom, and common sense to solve the real problems of management. Although the principles are not developed with great rigor, they are there and they are used by Beneke.

The organization is one that has seldom been used in farm management texts. The problems of getting established in farming, developing leasing arrangements, selecting a farm and obtaining credit are treated at the beginning of the book. Problems of crop, livestock, machinery and labor management come later. The book has a chapter on risk and uncertainty and two chapters on farm records. After having used this same organization in my classes this past year, I believe that it probably seems more real to the beginning student than the reverse order that is found in most textbooks.

There are some points in the book with which this reviewer would not agree. The points are mostly minor and will not all be enumerated here. Three will be mentioned. In regard to the use of budgets, even at this level it may be well to present some of the limitations of this planning technique. It is also a bit surprising that there was little mention of flexibility in the chapter on risk and uncertainty although flexibility in farm buildings is treated in a different chapter. Also, a more thorough analysis of the weaknesses of enterprise accounting would have been useful. The notion that enterprise accounts are all that are necessary for the successful management of a farm is all too firmly embedded in the minds of vocational agriculture graduates. Until this obstacle is overcome it is difficult to teach the dynamic aspects of farm management which, to be successful, must view the entire farm rather than the individual enterprise. Beneke sets a good example in this respect rather than specifically meeting the issue except for a few questions about enterprise accounting on page 428.

In summary, Beneke has written an excellent book if it is used for the purpose that the author intended. It probably will be disappointing if used above that level.

Emery N. Castle

Oregon State College

The Budgetary Process in the United States, Arthur Smithies, New York: McGraw-Hill Book Company, Inc., 1955, Pp. xxi, 486. $6.50.

This is primarily a study of budgetary procedure in the federal government. The whole range of budgetary operations is reviewed and appraised—in the Executive Office of the President, in the Congress, and to a lesser extent in the departments and agencies. Primary emphasis is placed on improvements in organization and procedure to facilitate more effective decision making at the several levels in the budgetary process.

The first half of the book is devoted to historical and other general background information and to a generalized critique of the budget process. Most of the second half discusses problems relating to budgets for particular programs—defense, water-resources programs, the agriculture program, veterans benefits, government-business enterprises, and federal grants-in-aid. The economic impact of the budget is discussed in a final chapter.

The level at which the discussion is pitched can be illustrated by specific recommendations for improvement of the budgetary process as a whole. The author believes that the present budgetary process suffers from an attempt to combine in one operation a review of past performance and presentation of a program for the future. He would separate these two phases by having the President submit to the Congress in January a review of operations for the past fiscal year, stressing questions of economy and efficiency, to be followed by a program budget in which activities would be grouped into major programs and emphasis would be placed on the financial needs of these programs. He would try to avoid burdening the President and the Congress with detailed decisions with respect to the budget. These would be gone into in the January annual report on performance during the past year which would be available for study by congressional committees prior to the consideration of the program budgets. Other general matters discussed include the overlapping jurisdictions of legislative and appropriation committees in the Congress, proposals to strengthen the appropriation committee staffs so that a more thorough review can be made of the President's budget, and the proper division of decision making among the different sectors of the government structure. Needless to say, most of these subjects are highly controversial.

Readers of this *Journal* may have most interest in the discussions of particular programs, such as water-resource programs, the agricultural program, and federal grants-in-aid. Despite sharp criticism of the use of benefit-cost calculations for the evaluation of individual resource development projects, the author finds a useful place for such analyses in ranking projects for priority of development. He attempts to classify

agricultural programs into those that support current operations and those that promote longer run agricultural improvement. In the opinion of this reviewer, this is rather artificial, but since it plays only a minor part in the analysis it does not mar an otherwise good discussion of the agricultural program. The agricultural program is used to illustrate problems created by preferred bugetary positions, such as those of CCC price supports and surplus removal under Section 32. The methods developed to control allocations of administrative expenses under the commodity stabilization program is held up as an example of good budgetary procedure. An appraisal of the experience of Canada and Australia with general grants-in-aid is included in the chapter on federal grants-in-aid.

Despite the persuasive arguments presented for the many proposed reforms in the budgetary process, it is unlikely, in the opinion of this reviewer, that these arguments will be entirely convincing to those responsible for reforms in this area. The process of budget making involves adjustments of conflicting interests at all stages, and interested parties can be expected to hold tenaciously to arrangements that are to their advantage. Nevertheless, this comprehensive study of the budgetary process will provide a better basis for an understanding of the major issues than has heretofore been available. Regardless of whether or not the reader agrees with the author's recommendations, he will benefit from his efforts to bring the issues into proper focus.

DONALD C. HORTON*

Bureau of the Budget
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* The views expressed here do not necessarily represent the official views of the Bureau of the Budget.

BENJAMIN HORACE HIBBARD, 1870-1955

WITH the death of Professor Benjamin H. Hibbard the craft of agricultural economists lost one of its most brilliant scholars. He died at Madison on August 11, 1955 in his 86th year. He was born January 9, 1870 in Bremer County, Iowa. Seven years later his family moved to O'Brien County, residing near Paulina. Here Benjamin and his three sisters grew up in a frontier community, settled mostly with German immigrants.

Due to the poor health of his father, he took on the responsibilities, at an early age, of operating the home farm of one-quarter section of land. But his mind was turned toward books and scholarship. He taught country school in his home community for a few years, combining this task with his farming duties. Then at the age of 25 he saw a chance to go on to school and he went to Ames. By this time he was already a serious student although he had attended school a total of only 35 weeks in his life. He graduated from Ames in 1898, with a brilliant record.

He enrolled as a graduate student at the University of Wisconsin in September 1899 and came under the inspiring teaching of Richard T. Ely and Frederick Jackson Turner. The Turner frontier thesis was new and made a deep impression upon the young scholar who had grown up among homesteaders, broken virgin prairie sod, and heard the neighbors respond to the call of Mr. Kelly and the Grange. As a graduate student at Wisconsin he roomed with H. C. Taylor in one of the many chapters of life that was to draw together these two Iowa farm boys. In 1902 he submitted a Ph.D. thesis to Professor Ely on the "History of Agriculture in Dane County, Wisconsin" in the same class with Henry C. Taylor and Allyn A. Young.

After receiving his degree, Dr. Hibbard returned to Ames as the head of the staff in economics, with early attention to farmer movements in relation to agricultural marketing. He studied in Europe in 1908, principally with Professor Karl Knies in the University of Halle. In 1913, he joined H. C. Taylor in the growing Department of Agricultural Economics at Wisconsin, where he spent the greater part of his professional career. He was a pioneer in every sense of the term in the field of Agricultural Economics and President of the American Farm Economic Association in 1922.

Professor Hibbard wrote extensively, and was respected around the world as an authority in the fields of agricultural policy, farmer movements, land policy, marketing, rural taxation and credit. He was dedicated to the public interest, with a broad social viewpoint in economics. Being a profound student of history, he appreciated that all social events have significant histories that can be fully understood only in their historical perspectives. But he was primarily a teacher, with an infectious enthusiasm for reading and a deep understanding of the classics. As a man of great learning with a prodigious memory, he was a sharp critic with a rare faculty for the penetrating phrase. His lectures were brightened with spontaneous wit, apt quotations and vivid insights. He was an artist who clinched his points with humor. His wit could be devastating. He leaves behind a host of students and friends grateful that he passed their way.

Professor Hibbard is survived by his wife Margaret, their son Howard, a graduate student in art history at Harvard University, and one daughter, Mrs. Virginia Marston, now residing with her two daughters in Ames, Iowa.

K. H. P.

NEWS NOTES

Andrew Anderson, State Agricultural Statistician for Nebraska and Hal Bryant, State Agricultural Statistician for Kentucky, received a certificate and lapel button for having completed 40 years of service in the Department of Agriculture. The awards were presented in their respective field headquarters after the June 1 ceremony in Washington, D.C.

Burl Back joined the staff at Oklahoma A. & M. College September 1, as Associate Professor. Dr. Back was formerly employed at Oregon State College.

Raleigh Barlow and Raymond Hoglund transferred July 1 from the Production Economics Research Branch, Agricultural Research Service, to the Department of Agricultural Economics, Michigan State University, as full-time State employees. Both men have been stationed at East Lansing since 1948 as cooperative employees of the Branch and Michigan State University.

Merrill K. Bennett, Director of the Food Research Institute of Stanford University, has been granted a leave of absence for the academic year 1955-56 to head one of the sections of an educational survey being conducted by the University of Pennsylvania. He will be director of the Survey of Research and Advanced Studies in the Social Sciences, and will serve from October 1, 1955 through June 30, 1956. Before taking up his duties in Philadelphia, Dr .Bennett will go to Washington, D.C. to serve as a consultant at meetings of the Interdepartmental Committee on Nutrition and National Defense to be held September 15-16 at the Public Health Service, U.S. Department of Health, Education, and Welfare.

Charles H. Benrud has been appointed Assistant Professor of Agricultural Economics at South Dakota State College.

Jyoti P. Bhattacharjee, for the last two years associated with the Food Research Institute of Stanford University on a study of the characteristics of population growth in the major Caribbean islands and Hawaii, has returned to India. He has accepted a position as director of the Agro-Economic Research Center, Visva-Bharati University, Saatiniketan, West Bengal.

J. F. Booth and A. H. Turner, Economics Division, Canada Department of Agriculture, S. Sinclair, University of Manitoba and W. Mackenzie, University of Alberta, attended the International Conference of Agricultural Economists in Helsinki.

Bernard J. Bowlen has resigned from Kansas State College in order to accept a position in the program planning division of the Caterpillar Tractor Company of Peoria, Illinois. Bowlen had been directing research in wheat price and income policy at the Kansas Agricultural Experiment Station.

John M. Brewster of Market Organization and Costs Branch, Marketing Research Division, AMS, received a superior Service Award from the Department of Agriculture in May 1955. The award was granted for unusual perception and leadership in developing analytical methods and completing complex research that provided a basis for evaluating the economic effects of newly developed methods of processing cottonseed.

Nellis A. Briscoe was appointed Assistant Professor of Agricultural Economics at Oklahoma A. & M. College July 1. He received his Ph.D. at Oklahoma A. & M. in August.

William G. Brown joined the staff at Oregon State College on October 1 as Assistant Professor of Agricultural Economics. Brown recently completed his graduate program in Agricultural Economics at Iowa State College. He

will specialize in the field of teaching and research in production economics in his new position.

Wilmer Browning, formerly a Kentucky Area Agent in Extension, has accepted a position as Extension Specialist in Agricultural Economics at the University of Kentucky.

George B. Byers is on a year's leave from the University of Kentucky to serve as Farm Management Expert with FAO at Rome. Most of Byers' time will be spent in the Far East in a study of increasing efficiency in the production of rice.

Edward Carson, formerly graduate student at Purdue University, has joined the staff of that institution as Extension Economist in farm management.

Ray Christensen, Production Economics Research Branch, Agricultural Research Service, accompanied the exchange group of USSR farm officials who visited the United States during July and August.

S. Kent Christensen joined the staff at Oregon State College on August 1 as Assistant Professor of Agricultural Economics. Dr. Christensen received his advanced degree in agricultural marketing at Cornell University. For the past two years he has been a member of the Cornell University staff working in the field of dairy marketing. At Oregon State College, he will direct research and teaching in the field of dairy and livestock marketing.

J. B. Claar has resigned as Extension Specialist in Farm Management, University of Illinois, to accept a position with the Federal Extension Service in Washington, D.C.

Wayne W. Clark became a staff member of the Texas Agricultural Experiment Station July 1, 1955, with the rank of Assistant Professor of Agricultural Economics. Clark will do full time research in fruit and vegetable marketing. He is a graduate of Brigham Young University and has completed his course work for his doctorate at the University of California.

Spencer B. Cleland, Professor of Agricultural Extension, University of Minnesota, retired July 1. Mr. Cleland was one of the pioneers in extension having spent more than 40 years in that area.

James W. Coddington, formerly on the staff of the University of Arkansas, Agricultural Experiment Station, in charge of the Federal-State Market News Service in Arkansas, has accepted an appointment with the Grain Division, AMS. He will be in charge of the newly opened Rice Market News Office at New Orleans, and will be responsible for the National Rice Report as well as coordinating Federal-State activities on Rice in Louisiana, Arkansas and Texas. He was succeeded by H. F. Stevens, formerly in charge of the Dairy and Poultry Market News Service at Jackson, Mississippi.

Roger B. Corbett assumed his duties as President of New Mexico A. & M. College on August 15, 1955. Dr. Corbett resigned as Agricultural Counsel for the National Association of Food Chains to accept the New Mexico post. He holds three degrees from Cornell, B.S., M.S., and Ph.D. He has been an instructor and economist as well as a member of the Extension Service at Cornell; Director of the Agricultural Experimental Station at the University of Maryland; economist with the Department of Agriculture; and Executive Secretary-Treasurer of the American Farm Bureau Federation.

Floyd L. Corty, who recently completed the requirements for the Ph.D. degree in Agricultural Economics at Cornell University, has accepted a position as a Cooperative Agent, Agricultural Marketing Service, effective September 1, 1955. He will work in the field of dairy marketing and will be stationed at Mississippi State College, Starksville, Mississippi.

C. Richard Creek returned to Colorado A. & M. College after a year's leave of absence working with the University of Peshewar in Pakistan.

Donald R. Davidson has joined the staff of the Dairy Branch, Farmer Cooperative Service, USDA, as Agricultural Economist. He recently received his M.S. degree from the University of Illinois.

Jack Davidson joined the staff at Colorado A. & M. College as Instructor in Economics and Junior Economist on the station staff, after completing the requirements for the Master's degree at Montana State College. He will teach the introductory agricultural economics principles course and do research work in the farm management field.

Irving F. Davis joined the staff at Colorado A. & M. College as Assistant Professor of Economics and Assistant Economist on the station staff after completing the requirements for the Ph.D. degree at the University California. Dr. Davis' primary research responsibility will be in the field of water resource development.

R. L. Davis, Jr., resigned his position as Assistant Professor of Agricultural Economics at Mississippi State College to accept a position with the Truckers Exchange Bank at Crystal Springs, Mississippi.

Henry W. Dill, Jr., joined the staff of the Production Economics Research Branch, Agricultural Research Service, on August 15, 1955. Mr. Dill transferred from the Soil Conservation Service where he had worked as a Soil Conservationist for 20 years. He will do research and service work in aerial photo interpretation to provide data on land use, soils and related items for use in appraisal studies of land and water utilization.

Arthur L. Domike joined the staff at the University of Rhode Island as Assistant Professor after finishing a grain marketing study at the University of Minnesota.

W. M. Drummond will be on leave of absence from the Department of Agricultural Economics, Ontario Agricultural College, Guelph, Ont., until October 1956 to work with the Royal Commission on Canadian Economic Development.

Irving Dubov has joined the staff of the University of Tennessee as an Assistant Professor and Assistant Agricultural Economist.

Dwight Eddy who was engaged in vocational agriculture in Vermont was appointed Assistant Agricultural Economist at the University of Vermont. He will be working on the farm management extension program currently in the process of expansion.

Willis G. Eichberger joined the staff of the Production Economics Research Branch, Agricultural Research Service, on July 5. His work will be primarily in connection with the Watershed Protection Program. He is stationed at Ames, Iowa.

Theo H. Ellis, formerly Extension Economist, University of Arizona, accepted a position as Assistant Professor in farm management in the Department of Agricultural Economics, North Dakota Agricultural College, effective October 1, 1955.

Roger Essman, who has completed requirements for his Master's degree in Agricultural Economics at the University of Nebraska, has accepted a position as Agricultural Economist in the Fruit and Vegetable Branch of Farmer Cooperative Service.

D. K. Fairbarns of the Canadian Department of Agriculture has joined the staff of Macdonald College to carry Professor MacFarlane's work while MacFarlane is on a year's leave of absence to study at Oxford University.

William A. Faught resigned his position as Southern Regional Cotton Marketing Project Leader to accept an appointment as Agricultural Economist of the Market Organizaion and Costs Branch, AMS, effective June 18, 1955.

Darrell F. Fienup, formerly Instructor in Agricultural Economics at the University of Wisconsin has accepted a position as Assistant Economist and Assistant Professor in Agricultural Economics at the University of Kentucky. Fienup will do research and teaching in agricultural marketing.

Charles M. Fischer, Assistant Professor of Agricultural Economics at Oregon State College, transferred on September 1 to a new position in the Extension Service at the College. Fischer will be in charge of a new poultry marketing extension program.

L. R. Fortier is on leave from the Economics Division, Canada Department of Agriculture, to attend the University of Vermont.

Karl A. Fox, formerly of the President's Council of Economic Advisers, has become Head of the Department of Economics and Sociology at Iowa State College.

William A. Frank completed his Ph.D. at the University of Chicago in March 1955. He is in the Office of the Executive Vice President and General Manager, Sperry Gyroscope Company, Great Neck, Long Island.

George Futhey has resigned as an assistant instructor at Ohio State University to accept an assistantship at Pennsylvania State University where he will continue his graduate work.

Robert E. Galloway, Social Science Analyst, of the Farm Population and Rural Life Branch, Agricultural Economics Division, AMS, transferred to the International Cooperation Administration on July 22, 1955. He will be working in Jordon on a special project.

A. J. Garbarino, Assistant Agricultural Economist at Tennessee, has been granted sabbatical leave for the college year 1955-56 to pursue graduate study toward the Ph.D. degree at North Carolina State College.

Martin D. Garber of Enid, Oklahoma, has been appointed as Director of Food Distribution Division, AMS. In this position he will assume responsibility for the National School Lunch Program, the Special School Milk Program, the distribution of surplus foods acquired by the Department and the Plentiful Foods Program.

Joseph E. Gartner joined the staff at the University of Rhode Island to work in floral and horticultural marketing after receiving his M.S. from the University of New Hampshire.

William E. Goble, Assistant Agricultural Economist at Tennessee, has been granted sabbatical leave for the college year 1955-56 to pursue graduate study toward the Ph.D. degree at Iowa State College.

Wylie Goodsell is on leave from the Production Economics Research Branch, Agricultural Research Service, while working with the Food and Agriculture Organizaion of the United Nations on principles of farm management research as applied to inland fisheries operations in several countries. Dr. Goodsell will also participate in an International Inland Fisheries Training Center to be held in Indonesia during November and early December.

Roger W. Gray, who has served as Acting Associate Economist in the Food Research Institute of Stanford University during the academic year 1954-55, has been appointed, as of September 1, 1955, Associate Economist and Associate Professor.

Roy W. Green has returned to the Department of Agricultural Economics

at the University of Georgia, College Experiment Station, after three years as agricultural representative for a machinery dealer. He is doing research in marketing vegetables.

Thomas I. Gunn, who was granted the Ph.D. degree in Agricultural Economics at Cornell University in September, 1955, will continue to work at the University in the field of poultry and egg marketing research.

Leigh H. Hammond joined the staff of the Texas Agricultural Experiment Station August 1, 1955, as Assistant Professor of Agricultural Economics. He is presently engaged in full time research in fruit and vegetable marketing. Hammond is a graduate of Clemson College and received his M.S. from the University of Tennessee.

Robert W. Harrison, formerly with the old Division of Land Economics, Bureau of Agricultural Economics, and the Bureau of Land Management, United States Department of the Interior, is now with the E. P. Jameson Family Trust.

James Hartnell, recently Western Supervisor for the Livestock Market News Service in San Francisco, transferred to Washington, D.C., as Chief, Market News Branch, Livestock Division, AMS. He succeeds C. L. McColloch who accepted an assignment with the International Cooperation Administration.

Dale E. Hathaway has been granted a year's leave of absence from Michigan State University to to accept a one year appointment on the staff of the Council of Economic Advisers.

Cecil B. Haver, formerly of the Department of Agricultural Economics of North Dakota Agricultural College, has been appointed a Research Associate at the University of Chicago, where he is engaged in a study of the economic aspects of federal investments in the West with particular reference to water-use and grazing.

Joseph C. Headley, graduate of the University of Illinois, will do farm management research work in the Department of Agricultural Economics, University of Arizona.

Earl O. Heady will be on leave from the Department of Economics and Sociology of Iowa State College during the Spring quarter 1956. He will be a Visiting Professor at Harvard University.

W. E. Hendrix, formerly with the Department of Economics of the University of Chicago, has been appointed Agricultural Economist in the Production Economics Research Branch, Agricultural Research Service, United States Department of Agriculture, where he will continue research into the problems of low productivity and low income in American agriculture.

William H. Heneberry, who has been a cooperative employee of the Production Economics Research Branch, Agricultural Research Service, and the Illinois Agricultural Experiment Station, became a full time ARS employee on July 1. He is now working on cooperative research projects at Michigan State University.

Wesley J. Hensen joined the staff of the Market Organization and Costs Branch, Marketing Research Division, AMS, in June 1955. Hansen was formerly with the Production and Marketing Administration and the Army Quartermaster Corps. Recently he has devoted his full time to farming.

Omer W. Herrmann has been appointed Deputy Administrator for Marketing Research and Statistics of the Agricultural Marketing Service, effective July 1, 1955. Dr. Herrmann will participate with the Administrator in over-all planning and administration of programs and activities of the Agricultural

Marketing Service. He will direct and coordinate, on behalf of the Administrator, the planning and administration of general broad research and statistical programs, including crop and livestock estimates work, marketing research, statistical and economic research, and farm population and related programs.

F. F. Hill, Provost of Cornell University and former head of its Department of Agricultural Economics, has accepted a position as a Vice-President with the Ford Foundation. He will begin his new duties on October 15, 1955 and will have particular responsibility for the overseas development of the program of the Foundation.

Verle R. Houghaboom has been granted a year's leave of absence at the University of Vermont to continue his program of graduate study at Michigan State University.

Eldon Houghton, Agricultural Estimates Division, AMS, left Washington, D.C., on June 12 for the Ohio Agricultural Statisticians Office at Columbus where he will be employed.

Helim H. Hulbert has been made Chief of the Business Administration Branch of Farmer Cooperative Service. He was a member of the Livestock and Wool Branch of that agency since its organization in 1934. Prior to that time he served with the Federal Farm Board, the Cooperative Division of the Bureau of Agricultural Economics, and the Packers and Stock Yards Administration. In 1953 he served as Assistant to the General Manager of the National Wool Marketing Corporation.

Fred E. Hulse of the Department of Agricultural Economics, University of Maryland, joined the staff of Farmer Cooperative Service, Fruit and Vegetable Branch.

David L. Hume has been appointed Assistant to the Director of the Poultry Division, AMS. He transferred from the Headquarters, U. S. Army Quartermaster, Market Center System, Chicago, Illinois, and will assume his new duties September 1.

T. N. Hurd returned to the staff of the Department of Agricultural Economics at Cornell University on July 1, 1955. He will do research and teaching in the field of business management.

Clarence C. Jensen joined the faculty at Montana State College on September 1 as Assistant Professor of Agricultural Economics and Economics. He has just completed graduate work for the Ph.D. degree at Michigan State College.

P. E. Johnston, University of Illinois, died July 30, in Deer River, Minnesota. He was head of the farm management division and had been on the staff since 1925.

Robert C. Jones, who has been engaging in private technical assistance work in Mexico, has been serving as part-time technical consultant to the Mexican Social Security Institute in connection with the extension of services to the rural areas. He has established a hostel and orientation center for persons wishing to know Mexico better. In addition he has completed arrangements for a plant which will process fish waste into meal and oil, using the Vio Bin process, for both animal and human food. His address is Chilpaneingo, 23, Mexico 11, U. F. Mexico.

Charles E. Kellogg, Assistant Administrator for Soil Survey, USDA, Soil Conservation Service, was presented an award for distinguished service by Michigan State University on August 19, 1955, on the occasion of the centennial anniversary of his alma mater.

E. E. Kern, Jr., resigned his position as Assistant Professor of Agricultural

Economics at Mississippi State College to accept an appointment in the Department of Agricultural Economics at Alabama Polytechnic Institute, effective August 8, 1955.

Albert R. Kendall, Supervisory Analytical Statistician in the Agricultural Estimates Division, AMS, transferred to the Farm Income Branch of the Agricultural Economics Division on July 1, 1955. He will be working on a farm expenditures study.

Ralph Kline, who is completing his requirements for the Ph.D. degree at North Carolina State this September, has accepted an assistant professorship at Ohio State University. Kline will be doing research work in fruit and vegetable marketing effective September 15.

B. H. Kristjanson joined the staff of the Economics Division, Canada Department of Agriculture, Ottawa. He was formerly Associate Professor in agricultural economics at North Dakota Agricultural College.

L. B. Kristjanson resigned from the staff of the Economics Division, Canada Department of Agriculture, to undertake graduate studies at the University of Wisconsin.

John Kupka, who recently completed the requirements for the Ph.D. degree in agricultural economics at Cornell University, has accepted a position as an economist for the Standard Oil Company in New Jersey.

George Ladd, formerly of the University of Illinois, has become Assistant Professor of Economics at Iowa State College. Primarily he will engage in research and extension activities pertaining to dairy marketing.

Norman E. Landgren has joined the staff in agricultural economics at the University of Arizona. He came from the University of Nebraska, where he was engaged in research work.

R. Donald Langmo, Assistant Professor of Industrial Engineering at Oregon State College, has joined the staff in agricultural economics on a half-time basis, effective August 1. Langmo will work on efficiency studies in agricultural marketing and also serve as a consultant on other efficiency studies undertaken by the Agricultural Experiment Station. For the past year, Langmo has been at the University of California at Los Angeles working on an advanced degree in Industrial Engineering.

Ben T. Lanham, Jr., Professor of Agricultural Economics, Alabama Polytechnic Institute, has taken a year's leave of absence to continue his work at Michigan State University.

Ted Leed of Ohio State University is transferring from consumer education to head up a project in retailer education under the Ohio Agricultural Extension Service.

D. L. MacFarlane is on leave from Macdonald College for one year to undertake studies in Europe.

W. Mackenzie, University of Alberta, is on leave to work for the Royal Commission inquiring into Canada's economic future.

Alvin J. Macomber recently joined the staff at Market Organization and Costs Branch, Marketing Research Division, AMS, having received his B.S. degree from Cornell University in February 1955.

Alden Manchester joined the staff of the Market Organization and Costs Branch, Marketing Research Division, AMS, in August 1955. He was formerly Secretary of the New England Research Council.

Lorenzo B. Mann, Chief of the Frozen Food Locker Branch of Farmer Cooperative Service, was awarded a superior service award by the U. S. Department of Agriculture in June 1955 for outstanding service to farmers through

contributions to the frozen food locker industry. In 1954 Mr. Mann also was selected by the Frozen Food Locker Institute as the man who made the outstanding contribution to the industry that year. The Institute's citation read: "In recognition for outstanding leadership and meritorious service to the Frozen Food Locker Industry."

Wilmoth C. McArthur joined the staff of the Production Economics Research Branch, Agricultural Research Service, on August 1. He is stationed at Athens, Georgia, where he is studying farming adjustment problems in Georgia.

Robert S. McGlothlin resigned his position at Montana State College to accepc an appointment at the University of Arizona as Assistant Professor on September 1.

Dean McKee, who completed his work at Iowa State, joined the staff at Michigan State University on October 10.

Wendell M. McMillan joined the Fruit and Vegetable Branch of Farmer Cooperative Service as an Agricultural Economist on July 11, 1955. During the past year Dr. McMillan has been in Denmark studying cooperatives on a Fulbright scholarship.

Leslie D. McMullin, Agricultural Economist, joined the staff of the Market Development Branch, Marketing Research Division, AMS, August 1, 1955.

Harold W. Miller, who obtained the Ph.D. degree at Cornell University in June 1955, joined the New York City food marketing staff as Extension Economist in marketing on July 18.

Bert D. Minor, who has completed work for a Master's Degree in Agricultural Economics at Michigan State University has joined the staff of the Frozen Food Locker Branch of Farmer Cooperative Service.

Arthur T. Mosher has been at the University of Chicago the past two years working on a study evaluating United States technical assistance activities in Latin America. He has been appointed Acting Professor of Extension Education at Cornell University for a three-year term, where he will direct a special seminar on agricultural development outside the United States, within a Ford Foundation project to improve the training in U. S. agricultural colleges of technical cooperation (Point 4) personnel.

John Muehlbeier was appointed Secretary of the Great Plains Council effective September 15. His office will be in the Department of Agricultural Economics, University of Nebraska. W. H. Brokaw, the former Secretary, will serve as consultant to the Great Plains Council.

Ray A. Murray has been appointed Associate Professor of Agricultural Economics at the University of Maryland. He will be engaged in extension and research in farm managament.

S. R. Newell, Director, Agricultural Estimates Division, AMS, represented AMS at the III Session of the Committee on Improvement of National Statistics and the III Inter-American Statistical Conference held in Brazil, beginning June 3. He also left Washington, D.C. for Honolulu, Hawaii on August 10 to discuss plans for a cooperative crop and livestock reporting service for the islands.

Leland Ott, who recently completed his requirements for an M.B.A. at Indiana University has joined the Purdue Universiy staff as Extension Economist in retail merchandising.

Jerry H. Padgett, formerly of Clemson College, joined the Department of Agricultural Economics of the College Experiment Station at Athens, Georgia, in August. He is doing research in marketing milk.

L. A. Parcher of Oklahoma A. & M. College was promoted to Dean of the Imperial Ethiopian College of Agriculture August 1. He will be on leave from Oklahoma A. & M. for two years.

William W. Peek, who recently completed the requirements for the Ph.D. degree in Agricultural Economics at Cornell University, has accepted a position at Chico State College, Chico, California. He will teach courses in economics, farm management, and marketing.

R. Perreault, Economics Division, Canada Department of Agriculture, is on leave to complete requirements for a Ph.D. at Michigan State University.

E. A. Perregaux retired on September 1 as Head of the Department of Agricultural Economics and Farm Management at the Universtiy of Connecticut. Dr. Perregaux, who had more than twenty-five year's service in the state, then accepted an appointment with the International Cooperation Administration to go to Laos in Indochina as Chief Agricultural Officer. Paul L. Putnam, who has served on the University staff since 1923, and who had been in charge of work in farm management, succeeded Perregaux as Head.

J. H. Peters retired from the Agricultural Estimates Division, AMS. on July 31, 1955. He plans to return to Sherman, New York, where he will manage Shiloh Farms.

Travis D. Phillips, who received his Master's Degree in August, was appointed Assistant Economist in the Department of Agricultural Economics at Mississippi State College, effective July 1, 1955.

Luther J. Pickrel has been appointed Extension Economist, University of Minnesota, succeeding the late D. C. Dvoracek. He came from Michigan State University where he completed the requirements for a Ph.D.

James S. Plaxico assumed his duties as Professor of Agricultural Economics at Oklahoma A. & M. College March 1. He formerly was on the staff at Virginia Polytechnic Institute.

C. W. Porter has been appointed Associate Professor in Agricultural Economics Extension at the Pennsylvania State University. He came to Pennsylvania from Maryland and is working in the field of consumer information.

Homer J. Preston, formerly of Farmer Cooperative Service, has rejoined that agency at Chief of its Fruit and Vegetable Branch. Dr. Preston transferred from the Agriculture Marketing Service.

M. E. Quenemoen was promoted to Extension Farm Management Specialist at Montana State College on July 1. Mr. Quenemoen had been county-agent-at-large, working with the farm and home development program.

William F. Railing has been appointed Assistant Professor of Agricultural Economics at South Dakota State College.

Philip M. Raup, University of Minnesota, combined attendance at the International Conference of Agricultural Economists with a study of land taxation problems, meeting with governmental and local officials in Finland, Denmark and Germany. He also attended the International Conference on Regional Planning and Development at Bedford College, London.

Oakley Ray who did graduate work in agricultural economics at Purdue University and at the University of Chicago prior to a two year tour of duty in the armed forces has joined the staff of Purdue University as Extension Economist in livestock marketing.

Gordon Riehl resigned as a research assistant at Ohio State University to accept a position as Economist with the Philadelphia Milk Market Administrator.

George B. Rogers, formerly on the staff of the University of New Hampshire, has accepted a position with Market Organization and Costs Branch, Marketing Research Division, AMS, and will be stationed at Durham, New Hampshire.

Niels Rorholm is serving as Acting Head of the Department of Agricultural Economics at the University of Rhode Island.

Harlund Routhe has been appointed Extension Specialist in Farm Management, University of Minnesota. He formerly was fieldman for the Southwest Minnesota Farm Management Association.

James S. St. Clair, formerly on the staff of the Arizona University, has joined the staff of the Market Organization and Costs Branch, Marketing Research Division, AMS, as an Agricultural Economist. He will be stationed at Tucson, Arizona.

Burna A. Schiro, Analytical Statistician in Agriculture, transferred to the Farm Income Branch, Agricultural Economics Division, AMS, on June 19, 1955, from the Department of Labor. He will be working with Mr. Kendall on the farm expenditures survey.

Shelby A. Robert, Jr., Agricultural Economist, Head, Product Development Section of Market Development Branch, Marketing Research Division, AMS, resigned the last of Sepember 1955 to accept a position with private industry.

Glenn D. Simpson, formerly Secretary of the Crop Reporting Board, Agricultural Estimates Division, became a Deputy Director of the Agricultural Estimates Division, AMS, on June 1, 1955.

Gordon R. Sitton joined the staff at Oregon State College on July as an Assistant Professor in Agricultural Economics. Dr. Sitton, who completed his advanced study in Agricultural Economics at Stanford University, has been on the staff of the University of California at Davis for the past five years. He will do farm management teaching and research at Oregon State College.

M. W. Slusher, USDA Agricultural Economist, assigned to the College of Agriculture, University of Arkansas, since 1939, died June 5. He was a native of Blacksburg, Virginia and a graduate of VPI. Since coming to the University of Arkansas in 1939, he has been working on problems of farm management in Arkansas' rice producing area.

Eldon D. Smith has joined the staff of the University of Tennessee as an Assistant Professor and Assistant Agricultural Economist.

Millard J. Stanek joined the staff of the Production Economics Research Branch, Agricultural Research Service, on July 5, He is attended at Lincoln, Nebraska, where his initial assignment is to investigate the effect of acreage allotments in the Southern Plains region.

Andrew Stewart, University of Alberta, was appointed to the Royal Commission inquiring into Canada's economic future.

Edwin Strand spent the summer on duty with the Production Economics Research Branch, Agricultural Research Service. During the 1954-55 school year Mr. Strand was on leave taking graduate work at Iowa State College. He will continue his graduate work during the coming year.

Douglas C. Strong joined the staff at the Utah State Agricultural College as Assistant Agricultural Economist. He had formerly been employed by the Bureau of Reclamation.

G. P. Summers, formerly Extension Specialist in Agricultural Economics, has accepted a position as personnel training officer in the Extension Service at the

University of Kentucky. Summers will be working with Ernest J. Nesius, Associate Director of Extension at Kentucky.

Chester Swank, former Assistant Agent Mahoning County, has accepted an instructorship at Ohio State University. He will be working in the field of consumer education.

John R. Tabb has been appointed Associate Professor at the Norfolk, Virginia Branch of the College of William and Mary. He will teach courses in banking and finance in the Department of Economics and Business Administration. He recently obtained the Ph.D. degree in Agricultural Economics at Cornell University.

Fred R. Taylor, formerly Head, Department of Agricultural Economics, University of Rhode Island, was appointed Chairman of the Department of Agricultural Economics, North Dakota Agricultural College, July 1, 1955.

Henry M. Taylor, State Agricultural Statistician for Virginia at Richmond, Agricultural Estimates Division, AMS, was given a Superior Service Award on June 1 for planning and directing the Virginia Federal-State Crop Reporting Service so that it has become a vital part of rural economy and has gained national recognition.

John R. Tedford left the University of Rhode Island to work for his Ph.D. at Iowa State College.

John W. Thomas joined the staff at New Mexico A & M College on July 1, 1955 as Assistant Agricultural Economist in the Department of Agricultural Economics. Dr. Thomas was on the staff at Arizona State College at Tempe, for one year. He received his Ph.D. from Iowa State College in December 1954.

W. N. Thompson, University of Illinois, returned to his duties on September 1, after serving 18 months with the Tennessee Valley Authority in Knoxville, Tennessee.

Sidney J. Tietema joined the staff in Agricultural Enonomics at Montana State College on September 1, where he will assist with a two-year program of contact research with the Bureau of Indian Affairs.

Warren K. Trotter has joined the Staff of Farm Supplies Branch, Farmer Cooperative Service. Dr. Trotter has completed his graduate work in Agricultural Economics at Cornell University and will work on problems of fertilizer procurement and distribution as related to cooperatives.

Carl J. Vosloh, Jr., has been employed by the Market Organization and Costs Branch, Marketing Research Division, AMS.

Otis T. Weaver was appointed Chief of the Cotton and Oilseeds Branch of Farmer Cooperative Service upon the retirement of W. W. Fetrow, formerly Chief of that Branch. Mr. Weaver first came with Farmer Cooperative Service in 1934. He also has been on the staff of the Tennessee Valley Authority as cooperative analyst and has served with the office of Military Government, U. S. Army forces in Korea. From 1927 to 1934 he was on the Staff of the Bureau of Agricultural Economics.

Fred C. Webster who has been working toward his Ph.D. at Cornell University has accepted a position as Associate Agricultural Economist at the University of Vermont.

Willard F. Williams, formerly Agricultural Economist for the Federal Reserve Bank of San Francisco, has joined the staff of the Market Organization and Costs Branch, Marketing Research Division, AMS, in Washington, D.C.

Oregon State College was recently awarded a $50,000 contract by the Fish and Wildlife Service of the Department of Interior to undertake a study of the economics of fish distribution in the Pacific Coast area. The study will cover wholesale and retail activities in the three Coast states and also include a survey of the household consumption of fish. The study will be directed by Dr. S. K. Christensen. Assisting him will be Russell Boshell, a recent graduate in Food Technology and Commercial Fisheries, and Frank Faha, a recent graduate in Agricultural Economics.

Following is a list of people from the United States who attended the Ninth International Conference of Agricultural Economics, Otaniemi, Finland, August 19-28, 1955.

J. Ackerman, Farm Foundation, Chicago
C. A. Anderson, Univ. of Kentucky
J. C. Bottum, Purdue Univ., Lafayette, Indiana
J. S. Brown, Mehlemerstrasse 10, Bonn, Germany
L. A. Bradford, Univ. of Kentucky
J. L. Buck, Council on Economic and Cultural Affairs, New York
W. D. Buddemeier, Univ. of Illinois, Urbana
H. C. M. Case, Univ. of Illinois, Urbana
E. Englund, American Embassy, London
P. J. Findlen, N.Y. State, Legislative Committee
H. G. Halcrow, Univ. of Connecticut
R. Jennings, U.S. Dept. of Agric., Washington, D.C.
G. Johnson, Michigan State College, East Lansing
Sherman Johnson, U.S. Dept. of Agric., Washington, D.C.
L. Johnston, USDA, Washington, D.C.
R. Krenz, Oslo
H. Larsen, American Embassy, Stockholm
F. B. Lent, Dairymen's League, New York
M. J. Meenen, Univ. of Arkansas
W. H. M. Morris, Purdue Univ., Lafayette, Indiana
W. G. Murray, Iowa State College
H. Myers, American Embassy, Oslo, Norway
M. Myers, South Dakota State College, Brookings
J. R. Otis, Alcorn A & M College, Lorman, Mississippi
D. Paarlberg, U.S. Dept. of Agric., Washington, D.C.
H. A. Pedersen, Mississippi State College
E. Rauchenstein, Madison 5, Wisconsin
P. Raup, University Farm, St. Paul 1, Minnesota
K. L. Robinson, Cornell University, Ithaca
T. W. Schultz, University of Chicago
C. Smith, Baldwinsville, New York
M. G. Smith, Ohio State University, Columbus
B. Stanton, Cornell University, Ithaca
H. H. Stippler, USDA, Corvallis, Oregon
B. C. Swerling, Stanford University, Stanford, California
H. C. Taylor, Washington, D.C.
J. M. Tinley, Univ. of California, Davis, California
G. E. Wanamaker, OCA, Frankfurt a.M., Germany
T. M. Venables, USDA, Washington
E. C. Young, Purdue University, Lafayette, Indiana

THE INTERNATIONAL CONFERENCE OF AGRICULTURAL ECONOMISTS

"Implications of Technical Change in Agriculture," was the central theme of the Ninth International Conference of Agricultural Economists held at Otaniemi, Finland, August 19-27, 1955. Approximately 350 people, about 300 men and 50 women, representing 37 countries, were in attendance; with 27 countries being represented by more than one delegate. Meetings referred to production, marketing and international trade. Approximately 55 papers and prepared discussions, in addition to free discussion from the floor, emphasized many aspects of technical change as it affects agriculture and the economic and social life of people in different countries and regions. Problems of adjustment to technical change and resource reallocations required to bring about change received emphasis.

The International Conference of Agricultural Economists was organized in 1929 at Dartington Hall, Devon, England. Although eight conferences have been held previously there was a nine-year gap from 1939 to 1947 due to World War II. Present plans are to hold a conference each third year. The main objectives of the organization are to foster the development of the science of agricultural economics in different countries; and to further the application of the results of economic investigation of agricultural processes and agricultural organization in the improvement of economic and social conditions relating to agricultural life.

The site of the recent Conference, which was adjacent to Helsinki on a wooded bank of an inlet from the sea, afforded excellent facilities. The auditorium, residence halls, and cafeteria building were constructed by students of the University in Helsinki under the direction of their instructors. The site now provides living quarters for the students who will continue for some time to attend classes in Helsinki, where laboratories and classrooms are situated although these are later to be erected at the new location. The buildings are constructed of concrete and brick and represent a high grade of workmanship.

In retrospect a dominant feature of a conference such as this seems to be that it provides a better understanding of the wide range of conditions and forces responsible for the present state of agriculture and marketing throughout the world. Papers and related discussions brought out the influence of land use policies, land transfers, technological developments, the marketing mechanism, prices, services available to farmers, and many other factors bearing on the economic well being of farm people. As in any conference, the give and take of attendants in private conversation outside the lecture room afforded means of acquiring many new ideas and more accurate information regarding conditions in different areas. Individual

expressions concerning the Conference substantiated the impression that all had gained much from their attendance.

The substance of an eight-day conference can not be presented in this limited space. After attending conference sessions one realizes more fully the wide range of prevailing conditions varying from areas of large surplus production to areas of surplus population with limited diets; highly developed technological production to very primitive production even within the same country; commercial agriculture to subsistence from the land; highly organized markets to practically no modern market development; densely settled to sparsely settled areas; areas of plentiful capital to areas of scarce capital and low agricultural development; and areas with a large percentage of population engaged in agriculture to those having a low percentage employed in this work even though production may be even greater for a given area of land.

Although the eight-day Conference at Otaniemi was the focal point of those in attendance, more than half the members of the Conference attended one or more of the five inspection trips. Approximately 90 people joined in the inspection trip starting in London and going from Ostende, Belgium to Helsinki, or the return trip, and a considerable proportion of the group made the round trip. Countries included in the trips were Belgium, the Netherlands, Germany, Denmark, Finland, Norway and Sweden. As in the past these trips made the Conference itself much more meaningful as the representatives from the countries visited did an excellent job in selecting points to be visited, including various types of farms, agricultural industries, related industries, agricultural markets, experiment stations, demonstration farms, and some points of tourist interest.

A local trip in Finland serves as an excellent example of the advantages to be gained from such tours. This trip afforded an insight into resettlement of more than 400,000 Finnish people representing about one-tenth of the people from all walks of life, and also one-tenth of all farmers. These people left what is now Russian territory when the land was taken over by Russia following the war in 1939. With the resettlement came the reclamation of land, the construction of buildings, the development of new techniques and an excellent job of organizing the farm outlets in a way that was producing a good living for the operators even though some tracts were very small. The cost of the resettlement was borne by the entire population of Finland.

The inspection trips made much more realistic the reports about cooperative development through the Scandinavian areas and the development of community interest and adult education respecting agriculture. The visit did much to emphasize the importance of sound credit structures in bringing about desirable changes in agriculture and the importance of well integrated agricultural production and marketing in developing effective

foreign trade in our highly competitive world agriculture. The extent of agricultural mechanization throughout Europe as compared with even ten years ago is impressive. Some countries have a tractor for about every two farms and mechanization in some areas includes the most modern of grain harvesting equipment.

Much of the success of a conference of this nature depends upon adequate financing. Major financial assistance in reestablishing the Conference since World War II has been provided by the Kellogg Foundation which helped materially in financing the 1952 Conference held at East Lansing, Michigan. After observing that Conference the Kellogg Foundation made a grant of $75,000 for a five-year period, with the provision that approximately one-fourth of the total was to be used in travel fellowships to the 1955 and 1958 conferences. This fund permits the employment of a half-time general secretary-treasurer and the support for the necessary travel, secretarial and office expense to carry on the work of the Conference.

Plans for the development of more permanent financial support for the Conference and the securing of a general secretary-treasurer were the responsibility of the American members of the Finance Committee consisting of Dean E. C. Young of Purdue University, Chancellor C. M. Hardin of the University of Nebraska, Dr. Joseph Ackerman of the Farm Foundation and Dr. L. J. Norton of the University of Illinois. Since February 1, 1955, Dr. H. C. M. Case, formerly head of the Department of Agricultural Economics of the University of Illinois has devoted half of his time to promoting the interests of the International Conference. Through his efforts additional financing amounting to more than $20,000 was obtained from the Rockefeller Foundation, the Whitney Foundation, the Council on Economic and Cultural Affairs, the Asia Foundation and a number of smaller contributors. These contributions provided part of the necessary funds to assist approximately 40 people from the North, Central and South Americas and the Pacific area to attend the Conference and also provided some assistance for approximately 25 people from the European area. In none of these instances was the grant sufficient to pay total travel expenses. Most of the grants to representatives from the Western Hemisphere ranged from $200 to $1,000, averaging approximately $600.

Tentative plans have been made to hold the next Conference in 1958. The Council, after considering the invitations from several countries, favored holding the Conference in India. Many of the Asiatic countries were represented at the Helsinki meeting and it was felt that holding the Conference in one of them in 1958 might do much to promote the development of agricultural economics in that part of the world.

Membership in the Conference is open to anyone interested in promoting the objectives of the Conference. The membership fee is $10, which

covers the Conference period of three years. In general, members in the United States have paid for the period extending through the current Conference and will receive the Proceedings which will be published in book form within a few months. New members may indicate their desire to receive the Proceedings of the past Conference. Dues of renewing members will cover the period through the 1958 Conference including the Proceedings of that Conference. The Conference also publishes a periodical entitled *Agrarian Affairs* which carries articles of a broad scope considered to be of interest to the members.

In addition, the Conference proposes to assemble authoritative statements on agricultural price and production policies from countries having experience in this field. The objective of this undertaking is to bring together the record of as much experience of interest to all countries as possible on this subject. Mimeographed copies of these statements will be issued to the membership as soon as possible but it is hoped that more formal publication of the material will follow. The entire membership fees will be required to cover the cost of published material being made available to the membership.

The Conference correspondent for the United States is Dr. Joseph Ackerman, Farm Foundation, 600 South Michigan Avenue, Chicago, Illinois. Membership dues may be sent either to him or to Dr. H. C. M. Case, General Secretary-Treasurer, ICAE, College of Agriculture, Urbana, Illinois.

AWARDS PROGRAM FOR 1956

The American Farm Economic Association will make the following awards in 1956:

(1) Award for the *best article* published in the *Journal of Farm Economics* in 1955,

(2) Awards for *published reports of research* in the field of Agricultural Economics, and

(3) Awards for *theses* submitted in partial fulfillment of requirements for the degree of Doctor of Philosophy in departments administering majors in Agricultural Economics.

1. Award for Best Journal Article

For the article judged best among those published in the *Journal of Farm Economics* during the calendar year 1955 an award of $100 will be made. The selection will be made by the Editorial Council.

2. Awards for Published Reports of Research in Agricultural Economics

(a) For the year 1956, there will be three awards of $250 each for bulletins, articles and pamphlets submitted for consideration. Books are not to be submitted.

(b) Selections will be made from published research bearing the publication date of 1955.

(c) Only publications prepared by persons 40 years of age or less at the time of publication will be considered.

(d) A report of research published in the *Journal of Farm Economics* by a person 40 years of age or less at the time of publication may be entered and considered for an award for published research. It will also receive consideration for the award for the best journal article, but may receive only one award.

(e) The Awards Committee for Published Reports will be made up of seven persons, in addition to the Chairman, representing the various fields which have been designated.

(f) Publications must be in the hands of the Chairman of the Awards Committee, Professor William H. Nicholls, Department of Economics and Business Administration, Vanderbilt University, Nashville 5, Tennessee, on or before March 1, 1956. Eight copies of each publication entered are requested, but fewer copies will be accepted in such cases as articles appearing in national journals or books otherwise available to the judges. In no event should less than three copies be sent.

(g) Members of the Awards Committee for Published Reports will not be eligible to submit papers of their own.

(h) Announcements of the awards will be made on or before the time of the 1956 Annual Meeting of the American Farm Economic Association.

3. *Awards for Ph.D. Theses*

(a) For the year 1956 there will be three awards of $250 each for Ph.D. theses.

(b) Theses in any field of Agricultural Economics may be submitted. Theses prepared by candidates for the Ph.D. degree in any department of Economics or Agricultural Economics in the United States are eligible for consideration, when submitted by the head of the department in which the work was done. No department, however, may submit more than one thesis.

(c) Selections will be made from theses submitted to a graduate school faculty during the calendar year 1955.

(d) A published Ph.D. thesis may be entered in both the published report—and the Ph.D. Thesis classes but shall be eligible for only one award.

(e) Theses must be in the hands of the Chairman of the Awards Committee, William H. Nicholls, Department of Economics and Business Administration, Vanderbilt University, Nashville 5, Tennessee on or before March 1, 1956.

(f) The Theses Awards Committee will be made up of three persons in addition to the Chairman.

(g) Announcement of the awards will be made on or before the time of the 1956 annual meeting of the American Farm Economic Association.

Karl Brandt, President

NOTE: The Awards Committee solicits the cooperation of members of the Association in encouraging participation in the program. Recognizing the reluctance of some authors to enter their own published reports, members may encourage them to do so, or arrange for others to submit published reports on behalf of eligible authors.

Announcements of the Awards Program suitable for posting are available upon request to the Chairman of the Awards Committee.

See back cover page of the Proceedings Number of the *Journal of Farm Economics*, December 1955, for the announcement of the recipients of the 1955 awards.

AFEA WINTER MEETING IN NEW YORK

DECEMBER 28-30, 1955 (*Note change in dates*)

The meeting is being held simultaneously and in part jointly with other professional associations. AFEA members have free access to the sessions of allied associations. AFEA headquarters will be at the HOTEL COMMODORE, where the meeting also will be held.

PROGRAM

Wednesday, December 28

10:00 A.M.: Registration

2:30 P.M.: *The Resources and Performance of Soviet Agriculture*
Chairman: Merrill K. Bennett, Stanford University
Speakers:
C. D. Harris, University of Chicago, "Soviet Agricultural Resources Reappraised"
Lazar Volin, U.S. Foreign Agricultural Service, "Soviet Agricultural Policy After Stalin: Results and Prospects"
D. Gale Johnson, University of Chicago, "Eye-Witness Appraisal of Soviet Farming, 1955"
Discussant: Otto Schiller, College of Agriculture, Hohenheim, Germany

6:00 P.M.: *AFEA Dinner Meeting*
Place: Schrafft's Restaurant, Chrysler Building
Chairman: Herrell DeGraff, Cornell University
Address: "Long-Range Prospects for Economic Growth and Agricultural Policy," Harold B. Rowe, Brookings Institution

8:30 P.M.: Joint Session with the American Economic Association: *Tariff Policy for the USA, A Strong, Rich Country*
Chairman: Charles P. Kindleberger, MIT
Speakers and Discussants:
Don D. Humphrey, Duke University
Lawrence W. Witt, Michigan State University
Richard M. Bissell, Jr., Washington, D.C.
Dennis W. Fitzgerald, International Cooperation Administration
Donald B. March, McGill University

Thursday, December 29

9:30 A.M.: Joint Session with the American Marketing Association and the American Economic Association: *The Dynamics of Food Retailing*
Chairman: Joseph Ackerman, Farm Foundation
Speakers:
Robert W. Mueller, Editor, *Progressive Grocer*
William Applebaum, Marketing Consultant
Richard H. Holton, Harvard University
Herbert Eklöh, Hagen, Germany
R. D. Hardesty, The Kroger Company

10:30 A.M.: Joint Session with the American Statistical Association: *A Critique of Federal Statistical Series; Index of Consumer Prices*
Chairman: Frederick F. Stephan, Princeton University
Speakers and Discussants:
Irving H. Siegel, Council of Economic Advisers
Ralph Stauber, U.S. Department of Agriculture
Lazare Teper, International Ladies' Garment Workers' Union
Laura Mae Webb, Office of Statistical Standards
H. E. Riley, Bureau of Labor Statistics

Lawrence Boger, Michigan State University

12 NOON: Informal Joint Luncheon, AFEA-AEA
Place: Skopas Restaurant, 149 East 42nd Street
Chairman: Glenn W. Hedlund, Cornell University

2:00 P.M.: Joint Session with the Econometric Society: *Application of Mathematical Programming to Agricultural Economic Problems*
Speakers:
Charles E. Bishop, North Carolina State College
Earl R. Swanson, University of Illinois
Irwin Katzman, Armour & Co.

2:30 P.M.: Joint Session with the American Economic Association: *The Population Spectre: Rapidly Declining Death Rates in Densely Populated Countries*
Chairman: Merrill K. Bennett, Stanford University
Speakers:
Kingsley Davis, University of California
Charles E. Kellogg, U. S. Department of Agriculture
Reuben E. Slesinger, University of Pittsburgh
Joseph J. Spengler, Duke University

8:30 P.M.: *American Economic Association Presidential Address*
Speaker: John D. Black, Harvard University

Friday, December 30

9:30 A.M.: Joint Session with the American Economic Association: *Land Tenure Situation Around the World*
Chairman: Joseph Ackerman, Farm Foundation
Speakers and Discussants:
Kenneth H. Parsons, University of Wisconsin
Lee R. Martin, North Carolina State College
José Vergara, Spanish Embassy, Washington, D.C.
Thomas H. Strong, Bureau of Agricultural Economics in Australia
Edmundo Flores, Nacional Financiera of Mexico
Wolf Ladejinsky, U.S. Department of State

2:00 P.M.: Joint Session with the Econometric Society: *Estimation of Economic Relationships*
Speakers:
Daniel B. Suits, University of Massachusetts
George W. Ladd, University of Illinois
Mark Nerlove, University of Chicago
Gordon King, Agricultural Marketing Service, U. S. Department of Agriculture
Gerhard Tintner, Iowa State College

2:30 P.M.: Joint Session with the American Economic Association: *Minimum Wages and Other Labor Standards Considered in Relation to Economic Growth in Underdeveloped Countries*
Chairman: Karl Brandt, Stanford University
Speakers and Discussants:
Elmo P. Hohman, Northwestern University
Jeanne S. Mintz, New York City
Louis J. Ducoff, U.S. Department of Agriculture
Egbert DeVries, International Bank for Reconstruction & Development
John P. Windmuller, Cornell University
John H. Richardson, University of California

6:00 P.M.: *American Farm Economic Association Executive Committee Dinner Meeting*

MARKETING OF AGRICULTURAL PRODUCTS

MAX E. BRUNK *and* L. B. DARRAH

—both N. Y. State College of Agriculture, Cornell University

Providing a thorough understanding of the economics of production and control, this textbook gives students an over-all picture of the mechanics of marketing farm products. Consistently practical, it shows how and why the marketing system operates as it does and indicates areas for improvement. Analyzes the factors that control the marketing process and set patterns for many of the market's specialized conditions. Covers assembling, storing, transporting, grading, financing, risk bearing, buying and selling, etc. *"Gives the student a chance to see agricultural marketing's broad implications."* J. C. GRADY, University of Missouri.

129 ills., tables; 419 pp. $5.50

COMMERCIAL POULTRY PRODUCTION

DEAN R. MARBLE, *Cornell University; and*

FRED P. JEFFREY, *University of Massachusetts*

An inclusive, up-to-the-minute discussion of the best and most profitable practices used today in the commercial production of eggs, chicks, and poultry meat. This textbook provides successful techniques for brooding, hatchery practice, housing, feeding and managing the laying flock, marketing, etc. Gives pertinent data on breeds, fowl physiology, nutrition, disease, and other technical aspects of poultry farming. Treats business aspects of the subject on a budget basis to allow use of local cost figures that fit existing operating conditions. ". . . *contains the very latest information with practical recommendations for its application.*" T. D. RUNNELS, University of Delaware.

185 ills., tables; 415 pp. $6

Business Aspects of COMMERCIAL POULTRY FARMING

L. B. DARRAH, *Cornell University*

This textbook studies the poultry industry's economic structure and emphasizes the business aspects of successful poultry farm management. Fully discusses the diverse factors influencing price. Answers the questions when and where to sell to best advantage, what to look for in a wholesaler, ways to cut cash outlay, how to anticipate poultry and egg prices, how to increase returns through selling at retail, and other points for marketing poultry products at maximum profit. Analyzing the choice of breed and the question of flock size from the standpoint of sustaining a profit over a number of years, book sets forth practical methods for increasing farm efficiency. ". . . *a well-written, compact, and digestible grasp of poultry economics.*" B. A. TOWER, Louisiana State University.

121 ills., tables; 204 pp. $4

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